14th A. G. A. Convention Opens Oct. 10

# AMERICAN GAS ASSOCIATION MONTHLY

Atlantic City Meeting Will Demonstrate Soundness of the Gas Industry

Gas and Electric Ranges

R. M. CONNER

Gas To Heat Water and Cook on New Zeppelin

Metallurgy of Malleableization

A. E. WHITE

RICHARD SCHNEIDEWIND

British Institution Reports on Gas Holder Maintenance

HERBERT W. ALRICH

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October 1932

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**420 Lexington Avenue, New York, N. Y.**

# AMERICAN GAS ASSOCIATION MONTHLY

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The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein.



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# *Arthur Hewitt Slated as Head Of American Gas Association*

ARTHUR HEWITT, Vice-President and General Manager of the Consumers' Gas Company of Toronto, will be elected President of the American Gas Association at the annual meeting in Atlantic City on October 10, 11 and 12. Mr. Hewitt's election became a virtual certainty yesterday on receipt of the report of the Nominating Committee, whose report is tantamount to election.

The American Gas Association is one of the most active trade associations, with a membership of more than 5,200. There are nearly 500 holding and operating companies contributing to its work, as well as 521 manufacturers of gas appliances and nearly all of the gas and natural gas enterprises on this continent are included in the membership. Extensive research laboratories are maintained by the association at Cleveland for the benefit of the industry.

"This recognition of Mr. Hewitt's standing in and work in behalf of the gas industry is thoroughly deserved," commented A. W. Austin, president of the Dominion Bank, and president of the Consumers' Gas Company. "At the same time we feel it a compliment that the honor has come to this company. Mr. Hewitt's predecessors in office have included a number of the outstanding business and financial leaders in the United States, and this will be the first time that the Presidency has come to a Canadian."

Mr. Hewitt has been connected with the company for forty-five years, starting his career as secretary to the manager. He was promoted from chief clerk to assistant to the general manager in 1907, and has been General Manager since 1909. The additional office of vice-president was accorded him in 1930.

# AMERICAN GAS ASSOCIATION MONTHLY

Allyn B. Tunis, Editor

Advisory Committee

E. Frank Gardiner

Frank LeRoy Blanchard
Edward F. McKay
Howard F. Weeks
Charles E. Wetzel

October, 1932 Volume XIV Number 10


# A. G. A. Convention Will Demonstrate Soundness of the Gas Industry

*R. W. Gallagher*
*President*

*Arthur Hewitt*
*Vice-President*

*N. C. McGowen*
*Vice-President*

*Howard Bruce*
*Vice-President*

*W. J. Welsh*
*Treasurer*

*Alexander Forward*
*Managing Director*

PLANS, policies and practices aimed to assure the continued strength and success of the industry will be expounded by prominent speakers at the Fourteenth Annual Convention of the American Gas Association, which will take place Monday, Tuesday and Wednesday, October 10, 11 and 12, at Atlantic City, N. J.

"Our annual meeting will demonstrate that the gas industry is on a sound financial basis," said R. W. Gallagher, president of the association. "Speakers who will be heard during our convention will point out how the association has pushed its research, striven to stimulate better sales practices, cooperated in the inauguration of improved methods in the arts of production and distribution, and helped to create new uses of gas. It may be said with confidence," continued Mr. Gallagher, "that our forthcoming convention will further point the way of how to meet the steadily growing demands of the public for our service."

All general sessions will take place at the Traymore Hotel. Meetings of the Commercial and Industrial Sections also will be held at the Traymore. The Natural Gas Department, Technical, and Publicity and Advertising Sections will hold their meetings at the Ambassador Hotel, while all sessions, including an exhibit of office equipment, will take place at Haddon Hall.

Again reduced rates to and from Atlantic City will be offered all A. G. A. members by the railroads, on the customary certificate basis.

Following is the tentative convention program:

# Convention Calendar

**MONDAY, OCTOBER 10**

9:00 a.m. Exhibition of Office Labor Saving Devices opens at Haddon Hall, Lounge Floor.
10:30 a.m. Manufacturers' Section meeting for election of officers.
2:00 p.m. Natural Gas Department Session, Ambassador Hotel.
2:00 p.m. First Accounting Section Session, Haddon Hall.
3:00 p.m. Publicity and Advertising Section Session, Ambassador Hotel.
8:15 p.m. First General Session, Traymore Hotel.
10:30 p.m. Entertainment, Traymore Hotel.

**TUESDAY, OCTOBER 11**

10:00 a.m. Second General Session, Traymore Hotel.
2:00 p.m. Second Accounting Section Session, Haddon Hall.
2:00 p.m. First Commercial Section Session, Traymore Hotel.
2:00 p.m. First Industrial Gas Section Session, Traymore Hotel.
2:00 p.m. First Technical Section Session, Ambassador Hotel.
8:30 p.m. Entertainment, Traymore Hotel.

**WEDNESDAY, OCTOBER 12**

10:00 a.m. Third General Session, Traymore Hotel.
2:00 p.m. Second Commercial Section Session, Traymore Hotel.
2:00 p.m. Second Industrial Gas Section Session, Traymore Hotel.
2:00 p.m. Second Technical Section Session, Ambassador Hotel.

MONDAY EVENING

October 10

8:15 o'clock

*First General Session*

BALLROOM—TRAYMORE HOTEL

Music
By Orchestra

Call to Order
By President

Presentation of American Gas Association Meritorious Service Medal
President Gallagher

Presentation of Charles A. Munroe Award

Presentation of Beal Medal
By E. R. Acker

Review of History of McCarter Medals and Their Influence on Cases of Resuscitation
Thomas N. McCarter

Address—"Men and Women Tomorrow"
Dr. Theodore J. Grayson, Dean Wharton School of Finance and Commerce, University of Pennsylvania

Music
By Orchestra

President's Reception, Lobby, Traymore Hotel

Dancing until 1:00 A.M.

TUESDAY MORNING

October 11

10:00 o'clock

*Second General Session*

BALLROOM—TRAYMORE HOTEL

Opening Remarks
President Gallagher

Greetings from American and Foreign Associations
Secretary K. R. Boyes

Address of Welcome
Mayor Harry Bacharach, of Atlantic City

Annual Report of Treasurer
William J. Welsh

Annual Report of the Managing Director
Alexander Forward

Annual Address of the President
Ralph W. Gallagher

Report of General Nominating Committee
J. K. Swanson, Chairman

Election of Officers

The remainder of the morning session will be devoted to brief discussions of the most important questions before the gas industry.

Conrad N. Lauer, President of the Philadelphia Gas Works Company and President of the American Society of Mechanical Engineers, will speak of the promotional work now being organized for the benefit of the industry.

Clifford E. Paige, immediate Past President of the Association and Vice-President of The Brooklyn Union Gas Company, will have something to say concerning the progress of our relations with appliance dealers.

B. J. Mullaney, another Past President, has another important matter to discuss.

There will be other speakers the Convention will want to hear from. It would not be complete without Henry L. Doherty.

Executive Session
Election of Company Members
Election of Directors
Election of General Nominating Committee
Election of Committee on Resolutions

8:30 P.M., Entertainment by Orchestra in American Dining Room, Followed by Dancing

WEDNESDAY MORNING

October 12

10:00 o'clock

*Third General Session*

BALLROOM—TRAYMORE HOTEL

"A Few Minutes with the Laboratory"
A. F. Bridge, Vice-President, Southern Counties Gas Co., Los Angeles, Calif.

"Gas in Industry"
F. J. Rutledge, Vice-President, United Gas Improvement Co., Philadelphia, Pa.

"Meeting Our Sales Problems"
B. J. Denman, Vice-President, The United Light & Power Co., Chicago, Ill.

"Taxes—The Perpetual Theme of Popular Complaint"
Dr. John T. Madden, Dean, School of Commerce and Accounts, New York University

Closing Remarks

## Manufacturers to Attend Commercial Meetings

**The Program Committee of the Commercial Section made a nation-wide survey of sales problems and activities in order to guarantee a program which will be of greatest value to gas company and manufacturer company delegates in attendance at the Convention. The program of the Section, printed herewith, recognizes the suggestions for speakers and topics received from gas companies and manufacturers located in various parts of the United States and the first day's session has been arranged to comprise a joint meeting of the Commercial and Manufacturers' Sections. In the absence of an exhibit it is expected that the attendance from the latter group will be greater than ever before.**

## Natural Gas Department

MONDAY AFTERNOON

October 10

2:00 o'clock

VENETIAN ROOM—HOTEL AMBASSADOR

Remarks of Chairman
T. J. Strickler, Kansas City Gas Co., Kansas City, Mo.

Report of Main Technical and Research Committee
H. C. Cooper, Chairman, Hope Natural Gas Co., Pittsburgh, Pa.

*T. J. Strickler*

Report of Nominating Committee
H. C. Cooper, Chairman, Hope Natural Gas Co., Pittsburgh, Pa.

The Relation of Investment to Revenue—Its Effect on Public Relations
R. W. Hendee, Vice-President, Oklahoma Natural Gas Corp., Tulsa, Okla.

The Service and Sales of Proper Appliances
F. M. Banks, Southern California Gas Co., Los Angeles, Calif.

Our Competitors
F. H. Brooks, Northern Gas & Pipe Line Company, Omaha, Nebraska

The Attitude of Public Utility Commissions Toward the Utilities
Karl Griffith, Chief Counsel, Lone Star Gas Corp., Dallas, Texas

## Accounting Section

MONDAY AFTERNOON

October 10

2:00 o'clock

VERNON ROOM—HADDON HALL

Remarks by Chairman
W. A. Doering
Boston Consolidated Gas Co., Boston, Mass.

*W. A. Doering*

Report of Nominating Committee
J. I. Blanchfield, Chairman, Brooklyn Union Gas Co., Brooklyn, N. Y.

Presentation: Customer Relations Group
R. P. Stacy, Chairman, Connecticut Light & Power Co., Hartford, Conn.

a. Customer Relations as Affected by Change to Mixed Gases
F. L. Griffith, The Peoples Gas Light & Coke Co., Chicago, Ill.

b. Customer Relations Training in Practice
F. E. Verdin, Syracuse Lighting Co., Syracuse, N. Y.

Presentation: General Accounting Group
D. H. Mitchell, Chairman, Northern Indiana Public Service Co., Hammond, Ind.

a. Court and Commission Decisions Affecting Accounting and Finance
F. L. Daily, Cooke, Sullivan and Ricks, Chicago, Ill.

Report: Committee on Uniform Classification of Accounts
H. M. Brundage, Chairman, Consolidated Gas Co. of New York, New York, N. Y.

Presentation: Office Management Group
Regulating Employment in the Offices
J. O. Hopwood, Chairman, Philadelphia Electric Co., Philadelphia, Pa.

## Entertainment Program

MONDAY EVENING, OCTOBER 10

**Immediately following adjournment of the First General Session, about 10:00 or 10:30 p.m., the President's Reception will be held in the lobby of the Traymore Hotel. Dancing in the Ballroom from 10:30 p.m. to 1:00 a.m. Music by the R. K. Olians.**

TUESDAY AFTERNOON, OCTOBER 11

**Ladies' Card Party and Tea—2:30 p.m., Traymore Hotel. Tea will be served at 4:30 p.m.**

TUESDAY EVENING, OCTOBER 11, 8:30 P.M.

American Dining Room, Traymore Hotel

**1. The R. K. Olians.**
**2. The Bonnie Laddies (Radio's Cheer Leaders).**
**3. "Senator" Ford (from Michigan, not Detroit).**
**4. Miss Jean Alexandria.**
**5. Dunninger—The Master Mind of Modern Mystery.**
**Dancing until 1:00 a.m. Music by the R. K. Olians.**

Golf

**Arrangements have been made with the Seaview Golf Club, and the Country Club of Atlantic City, so that A. G. A. members may enjoy the privileges of these Clubs from Monday, October 10, to Wednesday, October 13, inclusive. Cards of introduction will be obtainable at the Registration Desks.**

TUESDAY AFTERNOON

October 11

2:00 o'clock

VERNON ROOM—HADDON HALL

Presentation: Committee on Mechanical Office Equipment

a. Accounts Payable
H. A. Ehrmann, Chairman, Midland United Co., Chicago, Ill.

b. Distribution and Photo Strip Accounting
J. M. Kramarsik, Chairman, Connecticut Light & Power Co., Hartford, Conn.

c. "Wrinkles"
H. A. Ehrmann, Midland United Co., Chicago, Ill.

Presentation: Customers Accounting Group
E. N. Keller, Chairman, Philadelphia Electric Co., Philadelphia, Pa.

a. Meter Reading Sheets and Binders
W. H. German, Chairman, Harrisburg Gas Co., Harrisburg, Pa.

b. Credit and Collection System for Small Companies
L. A. Mayo, Connecticut Light & Power Co., Hartford, Conn.

Closing Remarks
H. M. Brundage, Consolidated Gas Co. of New York, New York, N. Y.

*Accounting Equipment Exhibit*

LOUNGE FLOOR—HADDON HALL

Open Daily 9:00 A.M. to 9:00 P.M.

Addressograph Co.
Burroughs Adding Machine Co.
Felt & Tarrant Mfg. Co.
International Business Machines Corp.
Postindex Co., Inc.
Remington Rand, Inc.
Underwood-Elliott-Fisher Co.

## Commercial Section

TUESDAY AFTERNOON

October 11

2:00 o'clock

ROSE ROOM—HOTEL TRAYMORE

*Joint Meeting of Manufacturers and Commercial Sections*

Remarks of Chairman
Samuel Insull, Jr., Midland United Co., Chicago, Ill.

*Samuel Insull, Jr.*

Report of Nominating Committee
E. R. Acker, Chairman, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.

How the Modern Gas Range Fits into the New Scheme of Things
W. Frank Roberts, Standard Gas Equipment Corp., Baltimore, Md.

## Rotarians to Hear Major Strickler

**One of the features of the A. G. A. Convention will be an address by Major T. J. Strickler, vice-president and general manager of the Kansas City Gas Company, Kansas City, Missouri, and chairman of the Natural Gas Department. Major Strickler has accepted an invitation to speak before the Atlantic City Rotary Club, Tuesday, October 11.**

Today's Advertising Needs
William H. Hodge, Byllesby Engineering & Management Corp., Chicago, Ill.

Dealer Cooperative Activities on the Pacific Coast
F. M. Banks, Southern California Gas Co., Los Angeles, Cal.

Some Thoughts on Servicing Activities
H. D. Lehman, Philadelphia Gas Works Co., Philadelphia, Pa.

WEDNESDAY AFTERNOON
October 12
2:00 o'clock
ROSE ROOM—HOTEL TRAYMORE

Air Conditioning—Home and Industry
W. R. Zuhlke, American Radiator Corp., New York, N. Y.

Marketing Automatic Water Heaters Today
J. T. Schilling, Des Moines Gas Co., Des Moines, Iowa

Methods and Results of Employee Sales Campaigns
H. C. Thomas, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

Home Service as a Sales Ally
Hugh Cuthrell, Brooklyn Union Gas Co., Brooklyn, N. Y.

Developing Retail Refrigeration Sales
Cyrus Barnes, Chas. H. Tenney & Co., Boston, Mass.

## Home Service Luncheon

WEDNESDAY NOON
October 12
SUBMARINE GRILL—TRAYMORE HOTEL
(Reservations must be made by 5:00 P.M., Tuesday, October 11, at A. G. A. Headquarters Office, Traymore Hotel)

Greetings from the Vice-Chairman of the Commercial Section
Walter C. Beckjord, Boston Consolidated Gas Co., Boston, Mass.

New Methods of Meat Cookery
Dr. Lucy Alexander, Bureau of Home Economics, Washington, D. C.

Home Service Activities
Group of two-minute talks by home service directors led by the Chairman of the Home Service Committee
Hulda Ungericht, Ohio Fuel Gas Co., Columbus, Ohio

*Hulda Ungericht*

Talks:
Individual Cookery Classes
Home Call Survey Work
Laundry Demonstrations
New Floor Kitchens
Classes for Salesmen
Range Contests
Trade Dealer Contacts
School Contacts

## Industrial Gas Section

TUESDAY AFTERNOON
October 11
2:00 o'clock
BELVEDERE ROOM—HOTEL TRAYMORE

Address of Chairman
W. F. Miller, Public Service Co. of Northern Ill., Chicago, Ill.

*W. F. Miller*

Report of Nominating Committee
D. W. Chapman, Chairman, The Peoples Gas Light & Coke Co., Chicago, Ill.

Paper: Industrial Gas Developments Sound Modern Gas Note
E. D. Milener, A. G. A. Headquarters, New York, N. Y.

Paper: Selling Industrial Gas in Present Competitive Market
J. P. Leinroth, Public Service Electric & Gas Co., Newark, N. J.

WEDNESDAY AFTERNOON
October 12
2:00 o'clock
BELVEDERE ROOM—HOTEL TRAYMORE
*Round Table Sales Conference*

Open Forum:
a. Baking
b. Hotels and Restaurants
c. Ceramics
d. Metal Melting
e. Steam Generation
f. Miscellaneous Application

## Manufacturers' Section

MONDAY MORNING
October 10
10:30 o'clock
BELVEDERE ROOM—TRAYMORE HOTEL

*D. F. Kahn, Chairman*

Election of officers

## Publicity and Advertising Section

MONDAY AFTERNOON
October 10
3:00 o'clock
JAPANESE ROOM—HOTEL AMBASSADOR

Report of Chairman
William H. Hodge, Byllesby Engineering and Management Corporation, Chicago, Ill.

*W. H. Hodge*

A. G. A. Motion Picture
a. "Ideal Fuel"
b. "Nature's Perfect Fuel"

National Advertising and Sales Organization
David F. Kahn, Chairman, Manufacturers' Section, Hamilton, Ohio

Discussion

The All-Gas Kichen Plan
Keith Clevenger, New York, N. Y.

Discussion

Report of Nominating Committee
Donald M. Mackie, Commonwealth & Southern Corporation, Jackson, Mich.

Election of Officers

## Technical Section

TUESDAY AFTERNOON
October 11
2:00 o'clock
VENETIAN ROOM—HOTEL AMBASSADOR
*Distribution Program*

Remarks of Chairman
I. K. Peck, Midland United Co., Chicago, Ill.

*I. K. Peck*

Report of Nominating Committee
R. G. Griswold, Chairman, H. L. Doherty & Co., New York, N. Y.

Distribution Committee Report
F. A. Lydecker, Chairman, Public Service Electric & Gas Co., Newark, N. J.

a. Results of Pipe Joints Research at the A. G. A. Laboratory
K. R. Knapp, A. G. A. Testing Laboratory, Cleveland, Ohio

Paper: Past and Future Practice on Pipe Joints
M. J. Mix, The Peoples Gas Light & Coke Co., Chicago, Ill.

Practical Soil Corrosion Survey with the Shepard Soil Corrosivity Rods
A. V. Smith, The United Gas Improvement Co., Philadelphia, Pa.

(Continued on page 441)

# Gas and Electric Ranges

By R. M. Conner
Director, A. G. A. Testing Laboratory

SO much conflicting information has been distributed of late on the construction and performance of gas and electric ranges that it seems quite desirable to present now some established facts on this subject. By inference or otherwise, gas ranges have been quite widely advertised and represented by manufacturers of competitive appliances as possessing the following fundamental disadvantages:

1. Less modern in design.
2. Do not permit the maintenance of a cool kitchen.
3. Increase shrinkage of foods.
4. Cause inferior food flavors.
5. Possess lower thermal efficiencies.
6. Discolor kitchen walls and windows, and pans.
7. Vitiate the normal air supply of the kitchen.
8. Possess fire, explosion, and asphyxiation hazards.

It would probably be best to take these various items up in their order and discuss them from the standpoint of the findings of the A. G. A. Laboratory and various other scientific institutions as well as from the viewpoint of practical experiences gained in the field.

There are about 80 gas range manufacturers in the United States and Canada producing a very wide variety of designs and types of gas ranges. During the past three years the improvements not only in gas range construction but more especially in design and appearance have been most marked.

The writer's unbiased opinion is that from the standpoint of beauty and convenience there is nothing in the way of a cooking device now on the market that surpasses the modern gas range. The purchaser may select from such a wide variety of designs that even the most discriminating buyer should have an ample number of makes and models from which to make his choice.

*Some convenience features of the modern gas range*

Very elaborate tests conducted at the A. G. A. Laboratory on the most modern types of gas and electric ranges (1932) indicate that most of the insulated gas ranges are equal, if not superior, to the better types of electric ranges from this standpoint. Consequently, the claim that a cooler kitchen can be maintained with an electric range on account of the reputed fact that there is less radiated heat from the oven, generally speaking, seems to be without basis of fact. As far as the top heating units are concerned, the gas range offers about 50 per cent greater cooking speed, and consequently does throw off a correspondingly larger amount of heat. When two top gas range burners are in use at the same time at full capacity, the increased heat output would be 12,000 B.t.u. (the maximum heat input to the giant burner) plus 9000 (for an ordinary top burner) less $2.1 \times 3412$ (the B.t.u. input of a large electric heating element) plus $1.2 \times 3412$ (the heat input to the medium size electric heating element), or approximately 9750 B.t.u. The increased top heat is entirely optional with the operator of a gas range. If speed is desired, he has it under his control;

and if the room temperature is excessive, it is also under his control by simply turning down the gas flame. This flexibility is impossible with an electric range.

Gas range ovens, like the top cooking units, heat up much more rapidly than electric (about 2.6 to 5.4 as fast). The average heat input during period of operation would probably be about twice that of an electric range. Where the oven in each case is flue connected this difference in input would make no appreciable difference in amount of heat thrown off. Of course, if neither unit were connected to a flue, the gas range oven would emit on an average roughly 25 per cent more heat. Certainly gas range ovens are more often connected to flues, however, than electric. Consequently, it seems reasonable to assume that in such instances electric range ovens would actually throw off more heat into the kitchen than gas. On the contrary, in the winter time when the kitchen doors and windows are closed, a gas range during the cooking period would materially assist in heating the home and over a period of years would certainly save the customer considerable on his fuel bills.

So much misinformation has been distributed on the subject of meat shrinkage that it may take years to correct the erroneous theories now existing in the minds of some housewives on this subject. Theoretically, meat should not be affected by the source of heat supply and if its application is of the same intensity and its distribution is approximately the same, the results obtained should also be similar. Very carefully conducted tests made at the A. G. A. Testing Laboratory during 1931 by home economics experts proved this assumption to be a fact. The following table shows that results obtained are quite similar when tests

*View of range testing section at the A. G. A. Testing Laboratory*

are carried out under carefully arranged scientific conditions.

References made to the superior flavor of foods cooked on gas or electric or any other kind of range are utter foolishness. The temperature and length of time foods are cooked naturally have a marked effect on their final flavor. Gas ranges are considerably more flexible in control than electric, and therefore permit the cooking of foods in most any orthodox manner that the housewife might choose. The type of pans used and their location on the cooking top or in the oven space also affect the ultimate results with either type of range, but any differences which may arise due to such causes should not be attributed to the type of heat energy employed. It would, therefore, seem that the flavor of cooked foods becomes a function of their nature and the manner in which they are cooked rather than of the type of appliance that is utilized to supply the necessary heat during their cooking processes.

As to the claim that electric ranges are more efficient in thermal performance than the average gas range at the present time, their operating cost is more than twice that for gas. It must be borne in mind that the relative thermal efficiencies of appliances using different sources of energy are not necessarily an index of their relative costs of operation. Too often thermal efficiency is confused with cost of operation. It would represent a fair index providing the commodity cost of equivalent heat units in each instance were the same; however, they are not. Even in manufactured gas territories where considerably higher average rates for gas service prevail than in natural gas districts, the cost per B.t.u. of useful heat from electricity on an average is more than twice that of gas. Consequently, the difference in thermal efficiency does not alter the fact that the cost of operating electric ranges on the average is much higher than for gas. Furthermore, statistics show that in natural gas territories the average cost of cooking with gas is about 1/7 that of electricity.

Competitors of the gas business often claim that cooking with gas soils cooking utensils, kitchen walls, and windows. Therefore, let us consider this theory in the light of conditions as they actually exist. City gas is composed largely of hydro-carbon gases, the combustion of which supplies the heat derived from this type of fuel. The products of combustion are nitrogen, carbon dioxide, and water vapor. Nitrogen is an inert gas and, in fact, composes about 78 per cent of the atmosphere which we breathe. Carbon dioxide is also a product of the normal respiration process and water vapor is present to a greater or lesser extent continuously in the air which surrounds us. It should be carefully noted that there has been no reference made to grease being present in the

SHRINKAGE TESTS

| | Electric Ranges | | Gas Ranges | | |
|---|---|---|---|---|---|
| | A Insulated | B Insulated | A Insulated | B Insulated | C Non-Insulated |
| Shrinkage—average per cent for each range | 18.94 | 22.25 | 19.80 | 21.50 | 21.35 |
| Shrinkage—average per cent for each type | 20.59 | | | 20.88 | |

*Checking the performance of gas ranges at the A. G. A. Testing Laboratory*

products of combustion simply for the reason that there is none.

Numerous observations made on cooking utensils which had been used daily at the A. G. A. Laboratory, some for as long as seven years, on properly adjusted gas appliances, indicate that no appreciable deposits of any nature could be noted. Such grease as collects on the kitchen walls comes entirely from the cooked foods and is present to a greater or lesser extent in the kitchen atmosphere during cooking periods, regardless of the type of range used. Dirt present in the kitchen atmosphere also generally combines with the greasy deposits on the walls, thus giving them a dark color. The amount and extent of such deposits, of course, depends on the size of the kitchen, the amount of ventilation which ordinarily prevails, and more especially, on the amount of top cooking done as well as the nature of the foods cooked. From a study of this information it can be seen that as far as gas and electricity are concerned, greasy kitchen walls and dirty utensils are not the result of the kind of fuel used but of the normal cooking process itself and the manner in which the cooking appliances are regulated.

It has been claimed that gas ranges vitiate the kitchen atmosphere by producing excessive percentages of carbon dioxide in the atmosphere in which they are installed, thus creating an unhealthful condition. This, if true, would be objectionable; consequently some technical aspects of this theory will be discussed.

As a practical example, we might assume a 10 x 12 x 8 ft. kitchen which is probably about average in size, with three air changes per hour. Assume that the oven and two top burners of a gas range supplied with 570 B.t.u. manufactured gas are in use at an average rate of consumption. The gas input in cubic feet would be about as follows:

| *Cooking Unit* | *Gas Consumption Cu.Ft. per Hr.* |
|---|---|
| Regular top burner | 7.5 |
| Giant top burner | 10.5 |
| Oven burner | 20.0 |
| Total gas consumption cu.ft. per hr. | 38.0 |

The combustion of one cu.ft. of manufactured gas of 570 B.t.u. heating value produces about ½ cu.ft. of carbon dioxide. Consequently, a gas appliance operating at the above total gas rate would produce about 19 cu.ft. of $CO_2$ hourly. The air content of a 10 x 12 x 8 ft. room is, roughly, 1000 cu.ft. Under such conditions the maximum concentration of $CO_2$ in the kitchen atmosphere would equal 19 times 100 divided by 3 times 1000, or 0.63 per cent, which is actually less than the concentration occasionally encountered in theaters, classrooms, and other places where people assemble. As a matter of fact, authorities state that air containing 2.5 per cent $CO_2$ can be breathed by a normal human being for considerable time without harmful effects. This figure is roughly four times the amount which would be produced under the above-mentioned conditions, which apparently explodes the theory that the use of city gas on account of the production of $CO_2$ is deleterious.

In advertisements, demonstrations and otherwise, an effort has been made at different times to show that fewer hazards are connected with the use of electric ranges than gas. It is unfortunate that some have been misled through unfair comparisons between old, unapproved, and obsolete model gas ranges and the most modern types of electric ranges. Consequently, any such comparisons can be discarded as meaningless. It is admitted that some of the old and unapproved gas ranges installed many years ago, when the art of cooking by gas was comparatively new, were not all that could have been desired from the standpoint of completeness of combustion, fire hazard, or explosion when measured by present-day standards. Notwithstanding this statement, however, even the most critical must admit that when we consider the fact that there are some 15 million gas ranges in use in the United States, any fair-minded person must agree that their safety record, when compared with that of other types of mechanical devices, is exceptionally good. Statistics show that since the enactment of a gas ordinance by a large Eastern city which requires the installation of registered appliances, accidents from such sources have been reduced more than 50 per cent.

To further insure the safe use of gas and to protect the public interest the American Gas Association established in 1925 a national non-profit making gas appliance testing laboratory in the city of Cleveland, the first of its kind in the world, dedicated to the development of the gas business to the end that it might serve to the fullest possible extent the best interest of the public. In this laboratory every appliance before being approved is thoroughly tested in accordance with nationally recognized standards for construction, durability, and safety of

performance, such standards being developed by leading engineers, health authorities, governmental bureaus, and allied interests.

Very elaborate fire hazard tests are made on every approved gas range, which conforms in principle, at least, to those applied by the Underwriters' Laboratories, which is the established and recognized authority on fire hazard matters. Leakage of raw gas is carefully guarded against by checking all portions of the gas range in which gas is carried under pressure, at considerably higher pressures than would ever prevail in service. Numerous tests are made to prevent the possibility of minor explosions or to neutralize their effect in the event that the customer is careless enough to permit them to occur. More care is taken by the Laboratory to insure completeness of combustion of the gas than on any other one item. Tests are made on a variety of different gases and at widely varying pressures without compensating changes in air shutter adjustments. Under all these different and very severe conditions of test combustion of the fuel must be practically complete. Consequently, any approved gas range, reasonably installed and with even a pretence made at its adjustment, should provide ample safety from the standpoint of fire hazard, explosion or asphyxiation when used in an ordinary manner.

While there is a great deal more that might be said on this subject, after all the best proof of acceptable service is the millions of customers who are satisfactorily using gas for cooking from day to day. In the spirit of fairness one must admit that the electric range as now produced is a very attractive piece of merchandise and that it has its place. From the standpoint of the economic and most other factors involved, however, the fact remains that where gas is available gas ranges should be used. Generally speaking, gas ranges possess a marked advantage from the standpoint of first cost. Their cost of maintenance is also considerably lower, they are more flexible in operation, and possess considerably greater speed in performance. Their operating costs on an average are less than one-half those of the electric range and the

(Continued on page 439)

## Industry Relies on Trade Associations

AMERICAN industrial concerns, which have come to rely so heavily upon their trade associations in normal times, find that in periods of depression the services of their associations are even more indispensible.

This is indicated by a survey of trade association membership and income changes just completed by the Trade Association Department of the Chamber of Commerce of the United States. The survey reveals a general condition of strength among trade organizations. As compared with much larger percentage declines in most lines of industry, the trade associations included in the survey reported only an average falling off of about 6 per cent in membership and a decline of a little more than 10 per cent in income in 1931 as compared with 1930.

One hundred ninety-eight associations reported a total income in 1931 of $10,541,524, a decrease of $1,260,747 from 1930. Membership totaling 132,933 concerns was reported as of January, 1932, a drop of 8,884 as compared with the year before.

The year 1931, the survey showed, recorded the formation of a number of new associations.

This healthy condition of the trade association movement speaks volumes for the usefulness of the services rendered by the associations to industry generally in the present business situation.

Commenting on the need for maintaining strong trade associations to assist industry in meeting the problems arising out of the depression, Silas H. Strawn, former President of the National Chamber, says:

"If ever trade associations were a good thing, they are doubly so now. Never was there a time when cooperation was so necessary, and when trade associations were more essential."

# Oklahoma Natural Realigns Executive Functions

*Robert W. Hendee*

*B. F. Pickard*

*W. K. Cottrell*

*W. J. Young*

REALIGNMENT of executive functions has been announced by Oklahoma Natural Gas Corporation, foremost of which is placing Vice-Presidents Robert W. Hendee and Ben F. Pickard in new assignments, and naming Fred W. Peters as comptroller.

Other executives affected are W. K. Cottrell, treasurer; W. Jennings Young, general sales manager; and Reid S. McBeth, assistant to President E. A. Olsen.

Mr. Hendee, senior vice-president, has been placed in charge of the western division with headquarters in Oklahoma City. He succeeds W. P. Canavan, resigned.

In his new assignment as vice-president in charge of operations, Mr. Pickard will direct the activities of the district offices, transmission and distribution systems.

With the appointment of Mr. Peters a division of duties with the treasurer has been made. Mr. Peters has charge of all accounting, reparation of budgets, all statistical matter, tax reports and similar matters. Mr. Cottrell, as treasurer, has charge of all funds, supervision of all purchases and insurance.

Formerly directing head of public relations, Mr. McBeth in addition assumes all duties incident to that of assistant to the president and in the handling of executive routine. Mr. Young's department, formerly known as new business, becomes the sales department and is wider in scope.

# The Metallurgy of Malleableization*

By A. E. White
and Richard Schneidewind

THE ultimate goal of many researches on malleableization is to determine the conditions under which the process can be carried out in shorter time. Before any intelligent discussion of short-cycle annealing can be entered into, however, it is well to have clearly in mind the metallurgical changes which occur when white iron is transformed into malleable iron. It is a fallacy to assume that short-cycle iron is a material distinct from ordinary malleable iron; its difference is merely a matter of degree. The same metallurgical laws must fit all grades of iron.

There are two general ways of reducing the malleableizing cycle: First, through better furnace design and atmosphere control, the time for bringing to heat and for cooling can be reduced and the use of packing material can be eliminated. Second, the rate of graphitization of the white iron can be increased. The factors which affect the malleableizing rate are as follows:

1. Raw materials.
2. Melting and casting conditions.
3. Special elements and impurities.
4. Carbon content.
5. Silicon content.
6. Temperature of annealing and temperature control.
7. Atmosphere.

The work done to date at the University of Michigan, sponsored by the Committee on Industrial Gas Research of the American Gas Association, has been confined to a study of the last four factors, which are discussed in this paper.

## Experimental Equipment

The apparatus necessary for conducting this study consisted of a gas-fired furnace, temperature-control equipment, a muffle, fixtures for holding the specimens, and apparatus for controlling the atmosphere within the muffle.

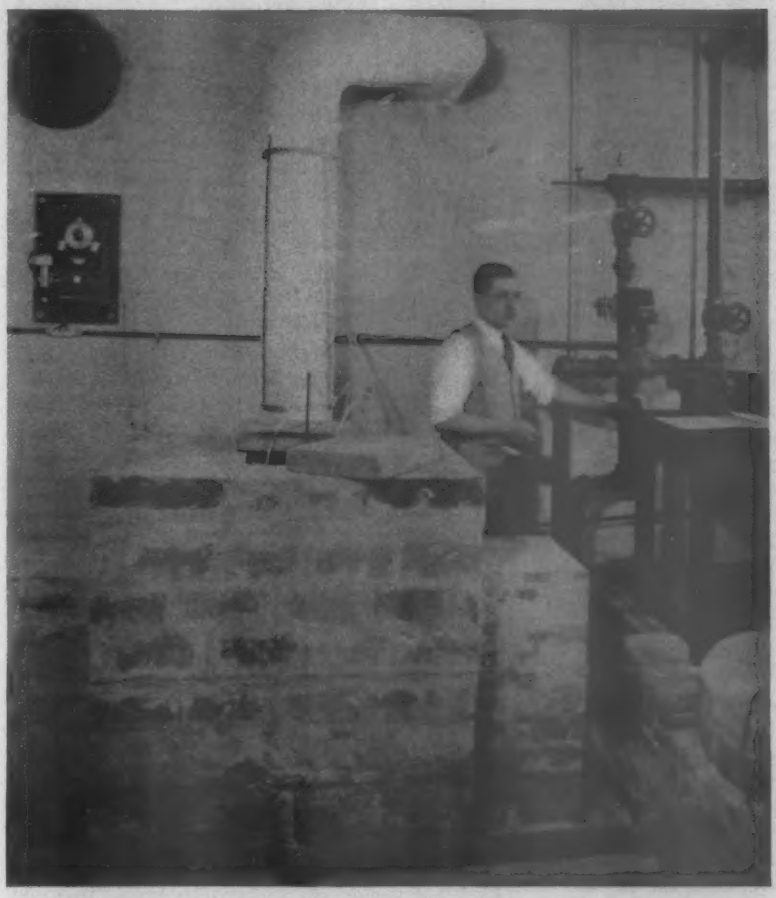


*Figure 1*
*The malleable iron research furnace*

### *The Furnace*

The furnace, constructed of silica brick, was made 40 inches long, 30 inches wide, and 40 inches high inside dimensions, with a combustion chamber built on at each end. Baffles were placed in front of the burners 10 inches from each end wall so that a central heating zone 20 inches square was made. The gases were completely burned before rising over the baffles so that no flames came within the central compartment which contained the muffle. The gases were drawn downward and out through a flue at the bottom of this compartment. The top of the furnace was made of two special fire bricks 30 inches by 15 inches by 4 inches. The opening thus left was used for charging and unloading. This opening was covered during operation by several large-sized fire bricks which were chipped out in order to permit the thermocouples and atmosphere pipes to be inserted. Figure 1 is a photograph of the furnace.

### *Temperature-Control Equipment*

Temperature control was effected by the use of an instrument manufactured by the Wilson-Maeulen

*Digest of paper presented on behalf of the A. G. A. Committee on Industrial Gas Research before the 1932 convention of the American Foundryman's Association.

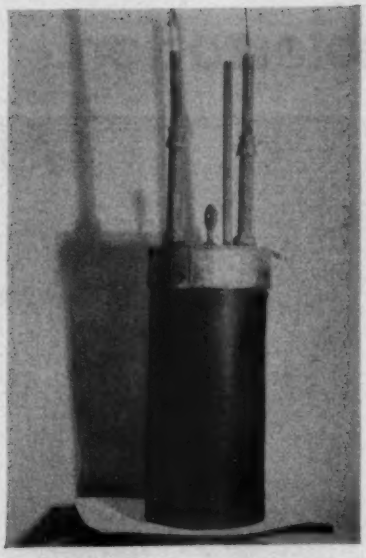


*Figure 2*
*Muffle, with cover in place*

Company and shown in Figure 1. The controller mounted on the wall and seen in the upper left of the picture operates the motorized valves shown in center right. The temperature, measured by a thermocouple placed one and one-half inches from the outside of the muffle and a few inches from the exit flue, actuates the controller which in turn operates a motorized valve which controls the supply of the gas-air mixture. There are maximum and minimum settings for both the gas and air supplies. It has been possible to maintain the temperature within the muffle within ± 5° F. over long periods. During the peak-load hours a slight manual adjustment sometimes becomes necessary due to the fluctuation of the gas pressure in the line.

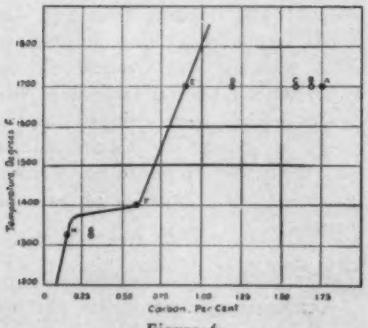



*Figure 4*
*Modified iron-carbon diagram for iron with 1.25% silicon*

The temperature in the muffle at a point corresponding to the lower end of the test specimens proved at all times to be within 2° F. of that at a point corresponding to the upper end of the specimens. During each run the temperature within the muffle was measured by means of two thermocouples placed at opposite sides of the muffle.

*Muffle*

The muffle itself consisted of a 20-inch length of cast-iron pipe 8 inches in diameter with a bottom welded on. Cast iron was chosen because it resists oxidation fairly well and because it is inexpensive and replacements can be made at a much lower cost than if the muffle were made of KA2 or similar material. The cover was made of heavy-gauge sheet steel with a handle and holes to admit thermocouples and pipes for the atmosphere. The muffle, cover, thermocouple tubes, and atmosphere tube are shown in Figure 2.

*Fixtures*

Twelve specimens were held at one time in a cage shown in Figure 3. Two extra compartments were provided to hold thermocouple tubes. When filled, the cage was lowered halfway down in the muffle where it rested upon fire bricks.

*Atmosphere Control*

The atmosphere inside of the muffle was obtained by burning a mixture of gas and air below the fixture containing the specimens. The flame was too small to add appreciably to the heat, but was large enough to fill the muffle completely every fifteen minutes with the products of combustion.

As first designed, compressed air and gas were led through flow-meters and conducted through a T-tube into a single one-fourth-inch pipe which was inserted through the top of the muffle. It was found that at 1700 and 1800° F. cracking of the gas took place so rapidly that the tubes became plugged with carbon within a few hours. A one-half-inch pipe was next used which proved satisfactory since plugging

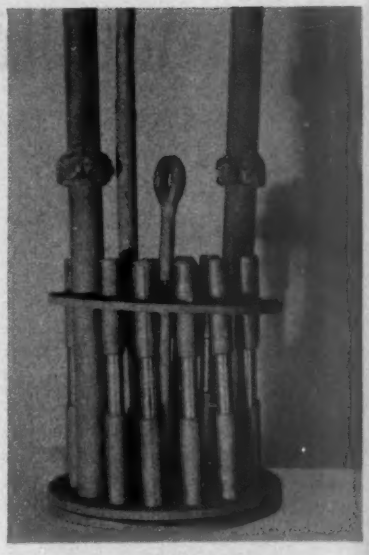


*Figure 3*
*Specimens and holder*

of a tube of this size required from 5 to 10 hours or longer.

The composition of the atmosphere was controlled by chemical analysis. From time to time samples of gas were withdrawn from the muffle into an Orsat apparatus and analyzed for carbon dioxide, carbon monoxide, and oxygen. No oxygen was found in any of the runs made in this study.

According to the findings of Jominy and Murphy in previous researches for the American Gas Association no scaling can take place at 1800° F. when the ratio of carbon dioxide to carbon monoxide, $\frac{CO^2}{CO_2}$, is 0.45 or less. At lower temperatures a little more carbon dioxide is permissible. Since the specimens were not packed, and since scaling

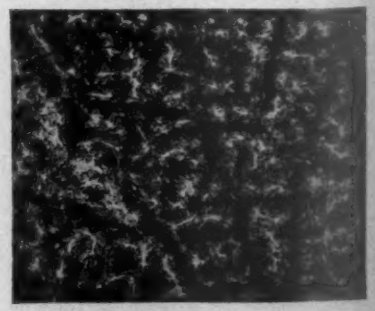


*Figure 5*
*White iron x 100 etched in 4% nital*

*Figure 6*
*White iron x 1000 etched in 4% nital*

would make the process worthless, a $\frac{CO_2}{CO}$ ratio of 0.45 was used as standard. Other ratios were used in some runs in order to investigate the effect of the atmosphere on the rate of malleableization.

### THE METALLURGY OF MALLEABLEIZATION

The iron-carbon diagram must be used as the basis of any discussion on the mechanism by which white iron is converted into malleable iron. The conventional diagram is not very helpful since it is based upon silicon-free material in which cementite, austenite, pearlite, and ferrite are stable phases at different temperatures. A partial diagram applicable to malleable iron obtained by experiment on an iron containing 1.25 per cent silicon will be used as an example and is shown in Figure 4. In the modified diagram graphite rather than cementite is a stable phase. Diminishing solubility of carbon in austenite is indicated from 1800° F. down to the critical range when a marked decrease in solubility takes place.

If a carbon content of 1.75 per cent and an initial soaking temperature of 1700° F. are assumed for sake of illustration, this point can be marked in the diagram of Figure 4 as the starting point, A. Figures 5 and 6 show the structure of this iron at 100 and 1,000 diameters, respectively, in the condition as cast. The latter picture indicates clearly that it is composed principally of pearlite with free cementite at the grain boundaries. The massive carbide may assume the network structure illustrated or may exist in dendritic grain-boundary form depending

*Figure 7*
*Heated 2 minutes at 1700° F. x 100 etched*

upon local conditions of solidification of the melt. The unevenness of tone of the matrix shown at 100 diameters indicates a cored grain, that is, the carbon content of the pearlite is not uniformly of eutectoid composition. At the first moment at heat, at 1700° F., the austenite formed from the pearlite tends to become uniform in composition. The carbon will be in two forms: 0.83 per cent will be in solid solution in austenite, and the remainder, 0.92 per cent will be combined as massive cementite. Nuclei of graphitization are soon formed. The course of malleableization will be followed chemically and metallographically in air-quenched specimens. Figures 7 and 8 show the material after 2 minutes at 1700° F.; the time to come to heat was 15 minutes. It is evident that the pearlite is quite uniform. A small graphite particle can be seen to have formed at a boundary between the pearlite, which of course

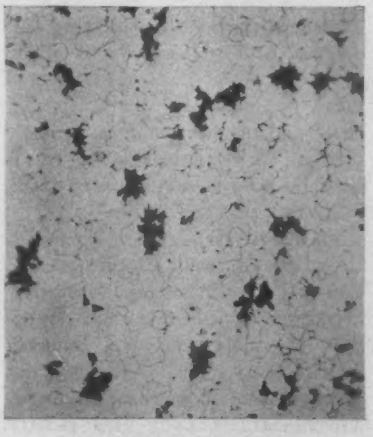


*Figure 9*
*Complete malleableization. Heated 20 hours at 1325° F. x 100 etched*

*Figure 8*
*Heated 2 minutes at 1700° F. x 1000 etched*

was austenite at 1700° F., and the cementite. The distribution of carbon is now 0.07 per cent as graphite, 0.83 per cent as austenite, and 0.85 per cent as free cementite.

After various longer periods at temperature it is apparent that the size of the graphite particles increases at the expense of the cementite. In the case of the iron under consideration, graphitization becomes progressively slower until after about three hours the free cementite has disappeared and equilibrium is reached; continued heating at this temperature produces no further graphitization. The distribution of carbon is now 0.92 per cent as graphite, 0.83 per cent as austenite, and zero per cent as free cementite. These various steps are marked as points A to E in Figure 4. The per cent of carbon to the left of the equilibrium line exists in solid solution in austenite; that between the line and the point, as cementite; that to the right of the point as graphite. The graphitization of cementite carbon, or the so-called "first stage of graphitization" is now completed. The average graphite size can be seen to increase. Graphitization evidently starts as a point which later grows and assumes a crab-like shape. It is to be noted that graphitization always takes place at a cementite-austenite interface. The exact mechanism for graphitization has not yet been demonstrated conclusively. It would seem, however, that austenite has the ability to form a supersaturated solution of carbon which is brought to saturation at such points as can act as centers or nuclei of graphitization. The continuation of the process to equilibrium can then be explained on the basis of further

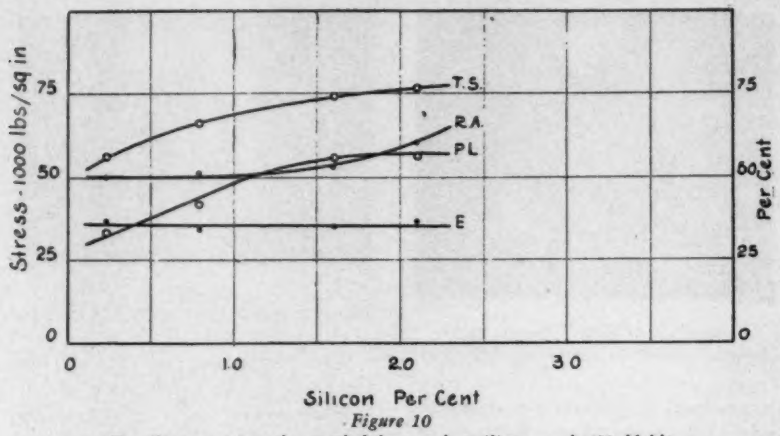



*Figure 10*

*Tensile properties of annealed low carbon-silicon steel (Hadfield)*

solution of carbon or cementite, migration of the carbon atoms, and final deposition as graphite. This hypothesis is borne out by work which indicates that the rate of graphitization at constant temperature follows the same law which governs the crystallization of salts from supersaturated aqueous solutions.

The temperature is then reduced to a point near the critical, at 1400° F., for example, and marked F in Figure 4. Since there is diminishing solubility of carbon in austenite with decreasing temperature, namely, 0.83 per cent at 1700° F., and 0.62 per cent at 1400° F., about 0.2 per cent of carbon has to be expelled in the process of cooling. If cooling is too rapid, the excess carbon may either form pro-eutectoid cementite in the grain boundaries or remain, forming a supercooled austenite; if the cooling is done sufficiently slowly, the excess carbon is deposited as graphite on the graphite nuclei. This latter process could be termed the graphitization of austenite carbon or the "intermediate state of graphitization."

When the temperature is further lowered below the critical range, for example, to 1325° F., the austenite is transformed to pearlite. The combined carbon exists in the form of cementite lamellae. In some irons these lamellae spherodize readily, in others the lamellae persist. Graphitization now takes place until the solubility conditions for this temperature are reached. Figure 9 shows malleableization completed. The mechanism seems to be that the carbide particles decompose, the carbon going into an unstable solution in alpha iron, and migrating to the graphite nuclei where it is deposited. These stages are marked in Figure 4 as points G and H. The distribution of the carbon is summarized in the following table.

form graphite nuclei. The atomic mobility governs the rate at which carbon atoms in the locally supersaturated austenite can travel or diffuse until they reach centers of graphitization. The facility with which these centers or nuclei are formed is probably intrinsic in the iron and is to a large extent inherited from the raw materials and is also affected by the process of melting and casting. Many nuclei mean shorter distances between graphitization centers and hence a shorter path for the carbon atoms to diffuse through the austenite. Any set of conditions which favors nucleus formation or increases the mobility of the carbon atom should by this reasoning increase the rate of malleableization. Elements which can combine with the constituents of white iron to form thin films or obstructions at the grain boundaries or increase the grain size should by the same token slow down graphitization.

TABLE I

DISTRIBUTION OF CARBON DURING MALLEABLEIZATION

| *Point* | *Graphite Per Cent* | *Austenite or Pearlite Carbon Per Cent* | *Cementite Carbon Per cent* | *Total Combined Carbon Per Cent* |
|---|---|---|---|---|
| A | 0.0 | 0.83 | 0.92 | 1.75 |
| B | 0.08 | 0.83 | 0.85 | 1.68 |
| C | 0.14 | 0.83 | 0.76 | 1.59 |
| D | 0.60 | 0.83 | 0.35 | 1.18 |
| E | 0.92 | 0.83 | 0.0 | 0.82 |
| F | 1.13 | 0.62 | 0.0 | 0.62 |
| G | 1.48 | 0.27 | 0.0 | 0.27 |
| H | 1.67 | 0.08 | 0.0 | 0.08 |

A new method of polishing, developed at the University of Michigan and used in the preparation of these specimens for metallographic examination, does not fragment and tear out the graphite. For this reason their boundaries and the true shape, size, and color are retained.

Malleableization has been discussed thus far as a process of solution of carbon to supersaturation, migration or diffusion, and deposition at certain favored locations which act as nuclei. Theoretically, then, the rate of graphitization must depend largely upon two factors: the mobility of the carbon atoms and the inherent ability of the iron to

## PHYSICAL PROPERTIES

Aside from the changes in microstructure and chemical composition significant changes in physical properties are brought about by malleableization. White cast irons have a tensile strength in excess of 80,000 pounds per square inch and a zero elongation. The hardness is about 350 Brinell. After malleableization the tensile strength is about 50,000 to 55,000 pounds per square inch, the elongation 15 per cent or over, and the Brinell hardness in the neighborhood of 125.

It is evident from a consideration of the nature of malleable iron that the physical properties in the ideal

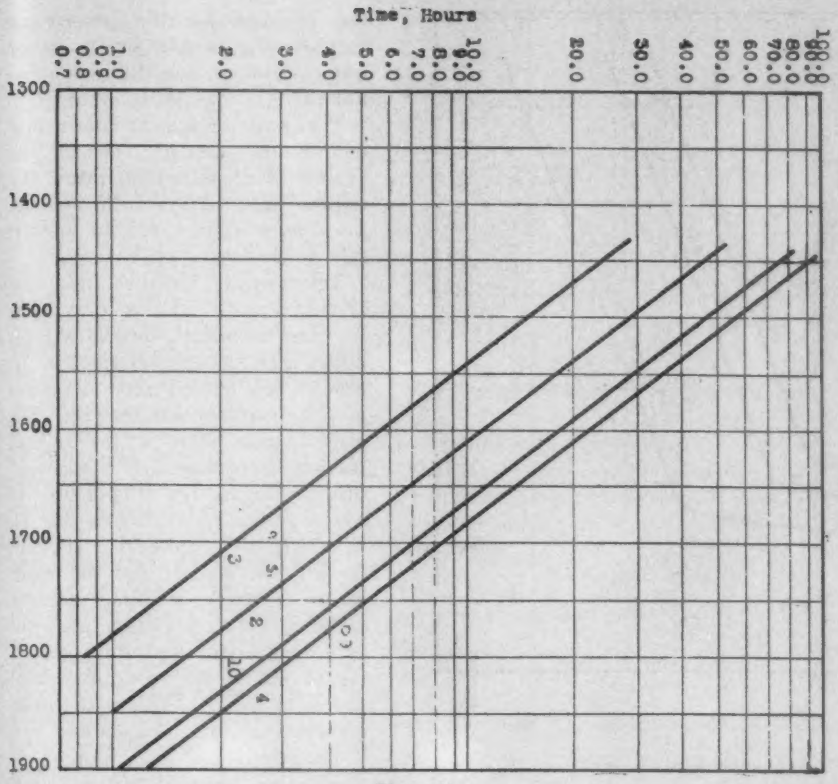



*Figure 11*
*The effect of temperature upon the time necessary for equilibrium*

case can approach but never exceed those of a very low carbon, annealed steel of the same silicon content. Figure 10 shows graphically the properties of low carbon, silicon steels in the annealed condition obtained by Hadfield. A comparison of the values for a one per cent silicon steel and of an average malleable iron tends to show that the graphite resulting from an initial total carbon content of about 2.5 per cent brings about a reduction of about 15 to 20 per cent in tensile strength and proportional limit and a reduction of about 50 per cent in elongation. One would expect better physical properties in a malleable iron containing less carbon. A higher silicon content should also materially increase the strength without impairing the ductility. This interpretation of Figure 10 is borne out by results of tests of irons containing from 1.6 to 1.9 per cent silicon and 1.25 to 1.5 per cent carbon which showed more than 70,000 pounds per square inch in tensile strength and elongations of 17.5 per cent and over. There is a danger in high silicon alloys of low impact values which may not be revealed in the tensile strength data; in addition foundry losses due to shrinkage and unsound castings are liable to increase. Regardless of the correctness of these speculations, however, it is apparent that the properties of malleable iron are due to the iron matrix; the graphite can only tend to weaken the whole. Further work will have to be done to show the effect of the size and distribution of the graphite on the physical properties.

## Some Factors Affecting the Rate of Malleableization

Various factors have been pointed out in the introduction to the paper which are known to affect the rate of malleableization. In the work done for the Committee on Industrial Gas Research at the University of Michigan to date, a quantitative study has been made on the effects of temperature, silicon content, total carbon content, and furnace atmosphere; the results of which are briefly summarized here. It will be attempted to show their effects upon the two fundamental factors set forth previously, namely, on atomic mobility and graphite nucleus formation.

### *Temperature*

The rate at which graphitization of the cementite carbon takes place is affected greatly by the soaking temperature used. For example, first stage graphitization is more rapid at 1800° F. than if a soaking tempera-

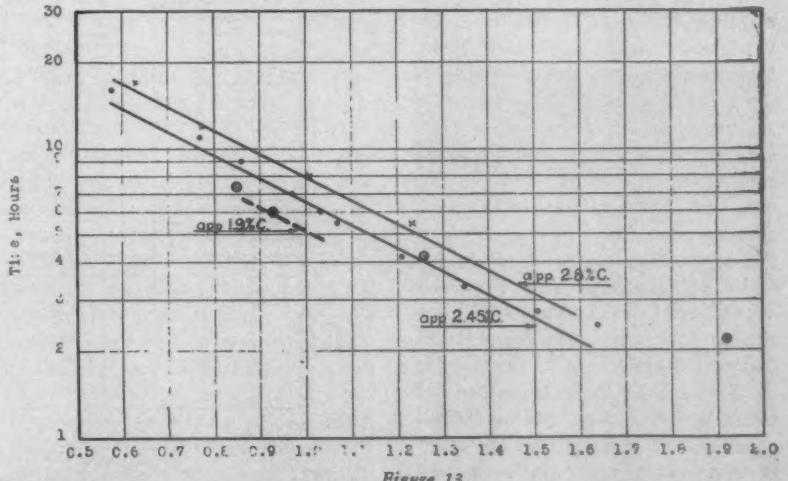



*Figure 13*
*Effect of silicon and carbon on time to reach equilibrium at 1697° F. (Kikuta)*

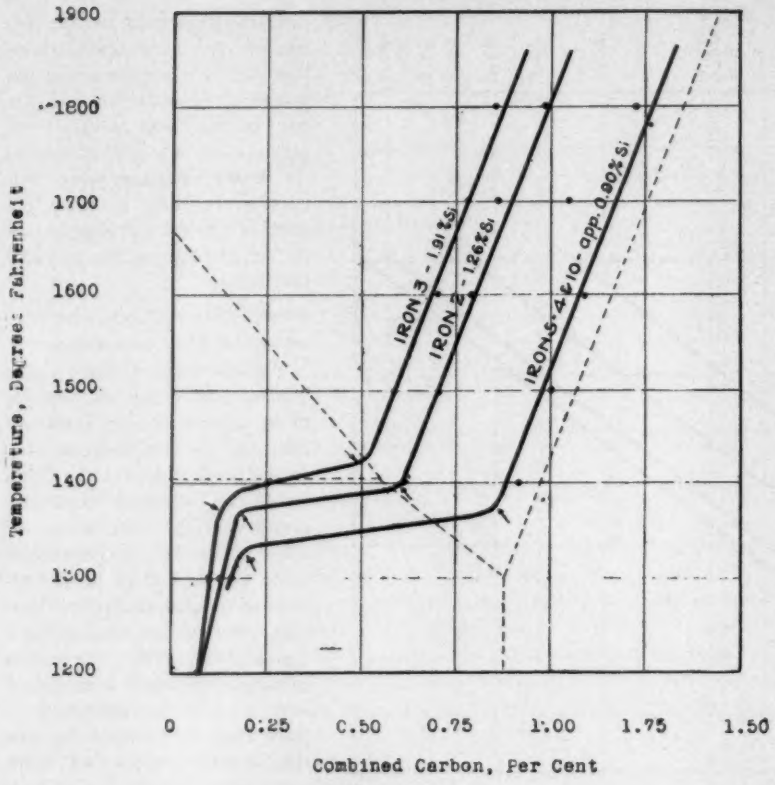



*Figure 12*
*Equilibrium diagrams*

ture of 1600° F. is used. The relationship between the time necessary to complete this stage and the temperature is logarithmic, and for an iron of 1.25 per cent silicon is shown in Figure 11. This relationship is given for irons of other compositions also for purposes of comparison. The quantitative position of the lines is correct for the irons investigated which were air-furnace irons made in the same furnace of the same raw materials and cast in sand molds. Graphitization rates can be modified by changing these conditions; for example, by using metal molds or by the use of other melting processes.

The mobility or the diffusion velocity of carbon in iron has been shown by Ishiwara to be a logarithmic function of the temperature and to follow a curve quite similar to the curve of the relationship between graphitization rate and temperature. It is likely that the effect of temperature upon the malleableization rate is largely due to its effect upon the mobility of the carbon. This point can further be substantiated mathematically by the fact that the equation for the process of graphitization is quite similar to the usual formulae for diffusion phenomena.

The work of Kikuta shows that temperature similarly affects the process of graphitization below the critical range. A few runs made by the present writers seem to support this conclusion.

Temperature, however, has also an effect upon nucleus formation. An iron malleableized with a high initial soaking temperature has, in general, smaller and more numerous graphite particles than the same iron malleableized with a low initial soaking temperature. It is apparent that the higher the temperature at which graphitization began, that is, at which the graphite nuclei were formed, the smaller and the more numerous are the resulting graphite particles. They also exhibit less tendency upon high temperature annealing to assume the spheroidal form and seem rather to follow the original austenite grain boundaries.

The selection of the soaking temperature for practical purposes must be governed by cost and by consideration of factors such as warpage, scaling, and decarburization. With better designed furnaces and with controlled atmospheres it is likely

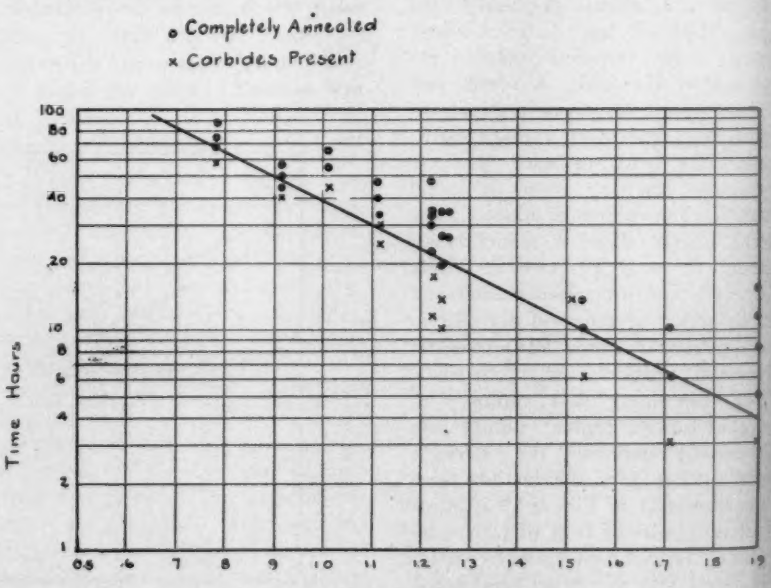



*Figure 14*
*Effect of silicon on second-stage annealing*

that the soaking temperatures may be raised to about 1725° F. or over whereas some plants soak at as low as 1550° F. at present.

*Silicon*

The silicon content is a most important variable in the making of malleable iron. Silicon raises the critical points as is shown in Figure 15. This is significant because it permits a higher temperature for second-stage graphitization which from the conclusions set forth above will materially reduce the malleableizing time.

Silicon also reduces the solubility of carbon in austenite. Figure 12 shows the equilibrium diagrams of iron of various silicon contents. This means that with high silicon more graphitization is accomplished in the first stage which is comparatively rapid as compared with the second stage. Furthermore, with high silicon, due to the decreased solubility, there will be less carbon left to be graphitized in the second stage. In fact, if a white iron were made with about 4.5 per cent silicon, the solubility of carbon in austenite would be so low that malleable iron could be made in a single first-stage operation.

The rate of first-stage malleableization at 1697° F. for irons of varying silicon content as obtained by Kikuta is given in Figure 13. A few points obtained by the present writers at 1700° F. are inserted which show fair agreement. These results indicate that with increasing silicon the time for first-stage graphitization decreases logarithmically.

*Figure 16*
*Surface of iron annealed in a gas atmosphere*

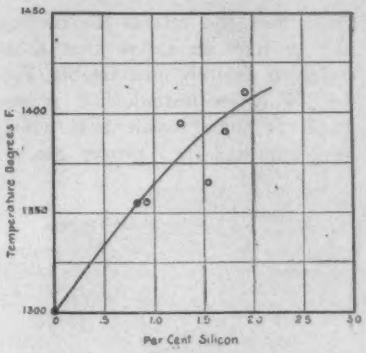



*Figure 15*
*Effect of silicon on the $A_{r_1}$ range*

Second-stage graphitization was studied in a series of irons of varying silicon contents. The analyses of the irons are given in the following table:

TABLE II
ANALYSES OF IRONS

| *Designation* | *Carbon Per Cent* | *Silicon Per Cent* |
|---|---|---|
| 17 | 2.00 | 0.72 |
| 16 | 2.06 | 0.79 |
| 5 | 1.89 | 0.93 |
| 15 | 2.06 | 1.04 |
| 19 | 2.06 | 1.12 |
| 18 | 2.05 | 1.21 |
| 3 | 1.91 | 1.92 |

These irons were heated to insure equilibrium at 1700° F., cooled to 1400° F. slowly enough to maintain equilibrium, and were finally held at 1325° F., which is below the $A_1$ range for all the irons studied. Specimens of each iron were removed from time to time and examined metallographically to observe the progress of malleableization. Figure 14 presents graphically the time necessary to complete the process. It is evident that as in the case of first-stage graphitization the time necessary to effect second-stage graphitization likewise decreases logarithmically with increasing silicon content. These findings are in accord with those of Kikuta. The cycle used above the critical was insufficient for Iron 17 and hence the results on that material were rejected.

The silicon content to be used commercially has in the past been governed by melting and casting practice. With 2.5 per cent carbon a silicon content of 1.25 per cent can not be exceeded without danger of the formation of primary graphite. In addition, consideration has to be taken of the fluidity, melting point, shrinkage, and general ease and economy of manufacture. Nevertheless, since greatly improved physical properties and annealing cycles under 20 hours are obtainable it may prove feasible and economical for certain types of work to adopt low-carbon, high-silicon irons despite their disadvantages.

*Carbon*

The total carbon content has for all practical purposes little effect upon the time necessary for graphitization above the critical. Naturally a higher content requires more time than a lower one. At 1700° F. in irons containing 0.9 per cent silicon it will take about 2 hours longer for one containing 2.5 per cent carbon to come to equilibrium than for the one containing 2.0 per cent carbon, other things being equal.

Kikuta reported greatly reduced periods for annealing below the critical temperature in irons of high total carbon. This same point was investigated in the present study. Irons of varying carbon contents and with about 0.9 per cent and 1.2 per cent of silicon, respectively, were investigated. Experimental procedure similar to the foregoing was used and the time necessary for graphitization below the critical range was observed metallographically. The analyses and annealing periods to complete second-stage graphitization are given in the following table, Table III.

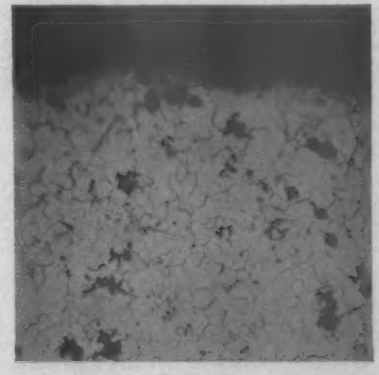


*Figure 17*
*Microstructure of iron annealed in a gas atmosphere. Note absence of decarburization x 150 etched*

It is apparent that from the limited number of tests, at least, no conclusions can be drawn as to the effect of total carbon on the graphitizing rate below the $A_1$ Kikuta believes that a higher total carbon content accelerates graphitization due to the increased amount of temper carbon present at the inception of second-stage malleableizing which acts favorably as nuclei or centers upon which further graphitization takes place. It would seem, however, that other factors such as slight differences in the sulphur or phosphorus contents, in the origin of the raw materials, or in the melting and casting practice exert a greater effect upon the rate of malleableization than does the total carbon.

TABLE III
ANALYSES OF IRONS

| *Designation* | *Carbon Per Cent* | *Silicon Per Cent* | *Time (Hrs.) at 1325° F.* |
|---|---|---|---|
| 12 | 1.68 | 0.89 | over 105 |
| 5 | 1.83 | 0.94 | 37.0 |
| 7 | 2.52 | 0.90 | 47.5 |
| M | 2.70 | 0.92 | 44.0 |
| B | 1.75 | 1.25 | 17.5 |
| 18 | 2.05 | 1.21 | 22.5 |
| 2 | 2.43 | 1.26 | 24.0 |

*Other Elements*

Many other elements have been studied with respect to their effect upon the rate of graphitization. In general, nickel, aluminum, and titanium tend to favor graphitization while manganese, sulphur, chromium, and molybdenum retard graphitization.

*Atmosphere*

The work done at the University of Michigan showed that the furnace atmosphere had little appreciable direct effect upon the rate of graphitization. Oxidizing, neutral, and reducing atmospheres were investigated. The indirect effect upon the speed of graphitization is on the other hand of considerable importance. By the maintenance of non-oxidizing atmospheres in the furnace it is possible to eliminate the use of packing material which procedure will save money in heating and time to attain temperature. The use of packing material entails about 50 hours of heating to bring the charge up to heat and retards the cooling rate to such an extent that short cycles are entirely unattainable. Figure 16 is an unretouched photograph of some tensile bars which were annealed in a proper gas atmosphere. The narrow portion had been ground before annealing and nothing except wiping in a cloth was done to clean the surface after annealing. Note the freedom from scale. Figure 17 is a photomicrograph of an iron annealed in a gas atmosphere. No decarburization or pearlite run is visible.

ANNEALING CYCLES

All this experimental work had as its goal the determination of the characteristics of malleableization and of the shortest annealing cycles for the production of malleable iron. Malleableization was found to take place in the following stages:

a. Decomposition of massive cementite, $Fe_3C$, at the highest or soaking temperature to form graphite.

b. Elimination of graphite from saturated austenite as the temperature is dropped to the critical range. If the temperature is dropped too rapidly pro-eutectoid cementite may be formed instead.

c. Graphitization of the eutectoid cementite below the critical range.

CONCLUSIONS

It would seem from a study of the results set forth that the major problem in short-cycle malleableizing must be one of furnace design and atmosphere control. In many of the batch-type furnaces used at the present time over 50 hours are taken to bring the charge up to heat and up to 20 hours to cool the work after malleableization is completed. The use of packing material makes the cooling rate from the soaking temperature so slow that time is wasted at this point. If over 70 hours are taken up in non-profitable heating, short-cycles are entirely out of the question. There are commercial plants today which have taken advantage of good furnace design and with an iron of average composition of about 1.1 per cent silicon content have cut their production cycle to under 60 hours total time.

If still greater reductions in time are to be made they will have to be effected through the use of higher silicon alloys and by the close control of the raw materials and of the melting and casting practice.

## Miss Markey Answers Cupid's Call

*Miss Markey*

CUPID'S shafts soon will carry a popular figure from A. G. A. headquarters. Miss Margaret Markey, for many years secretary to K. R. Boyes, the Association's secretary, announced Oct. 1 that she soon will leave to be married to Carl H. Harris of Santa Monica, Calif.

Miss Markey has many friends, not only at headquarters, but throughout the industry, and all wish her happiness and a safe and pleasant trip to California, where her honeymoon will be spent.

## Why Worry?

**I wonder why folks worry? There are only two reasons for worry. Either you are successful or you are not successful. If you are successful, there is nothing to worry about; if you are not successful there are only two things to worry about. Your health is either good or you are sick; if your health is good there is nothing to worry about; if you are sick there are only two things to worry about. You are going to get well or you are going to die; if you are going to get well there is nothing to worry about; if you are going to die there are only two things to worry about. You are either going to heaven or you are not going to heaven; if you are going to heaven there is nothing to worry about; and if you are going to the other place you will be so damned busy shaking hands with your old friends you won't have time to worry—so why worry?**

# Gas To Heat Water and Cook on New Zep.

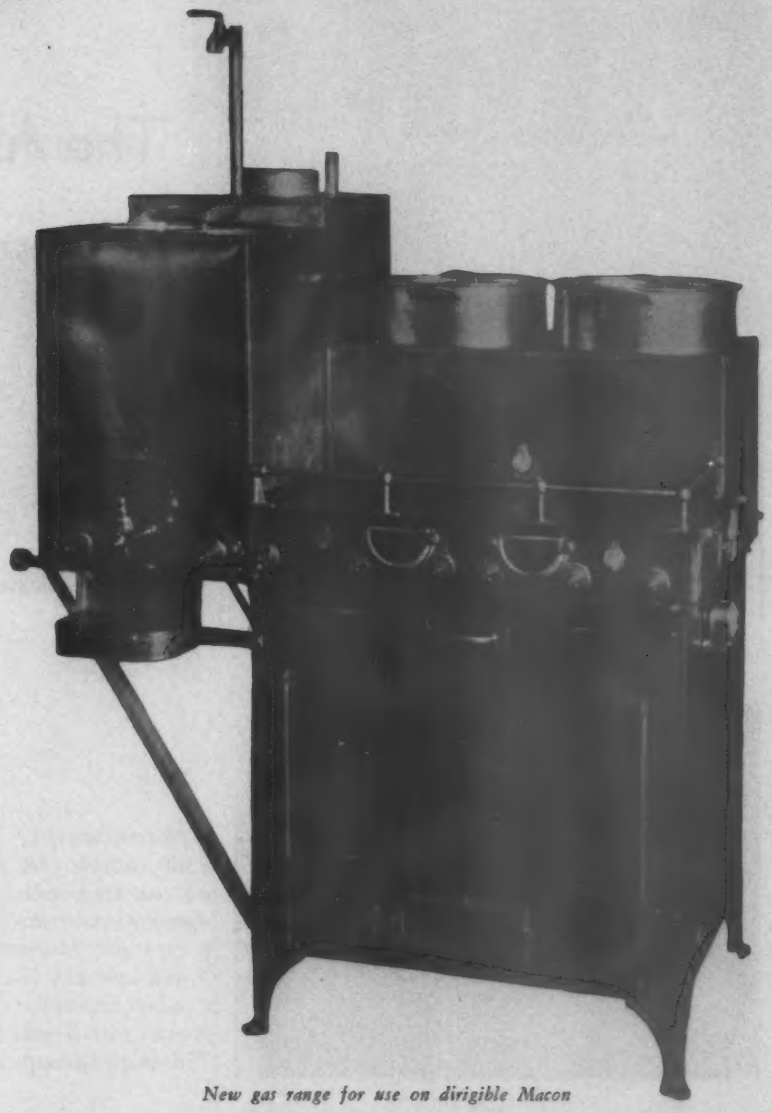
GAS men will be particularly interested in the development of the gas range built for use on the United States Navy Zeppelin *Macon*, newest and largest airship in the World. This range has been completed and has been publicly exhibited in Cleveland, Ohio, where it attracted widespread attention from the public. The modern features of this range further demonstrate definitely the steady progress being made by the gas industry to better serve the public.

The features, especially adapted to airship use, include stainless steel construction, an oven equipped with heat control, safety pilots, and special arrangements to utilize efficiently the gas which not only cooks, but thermostatically operates a water heater which is a part of the range.

Lightness of weight and heavy duty capacity are combined in a remarkable degree within this range, a product of the Tappan Stove Company, Mansfield, Ohio. Its weight, including the coffee urn and water heater, is just about one-half of the ordinary domestic range—140 pounds.

Restaurant duty capacity is provided by two burners for general cooking and frying. Two stock pots with a combined capacity of 100 good-sized bowls of soup, or which may be used for boiling potatoes, making stews, etc., and an oven which will bake twelve large loaves of bread or roast 50 pounds of meat are parts of the range.

In addition to these, there is the coffee urn with a capacity of more than 100 cups, and a water heater with a capacity of eight and one-half gallons. These are heated by the waste heat of the oven and top burners.



*New gas range for use on dirigible Macon*

The flue travel for the products of combustion from the oven, top burners, and stock pots passes through port holes into the urn and water heater section, passes around the coffee urn, then around the water heater and into the stock pot which is directly above the water heater.

The oven is controlled by a Robertshaw oven thermostat, and gives perfect control of the heat.

The coffee urn has a standby pilot. The water heater has a temperature control manufactured by Robertshaw—and gives water of any desired temperature. The water heater also has a safety pilot valve manufactured by the Spencer Manufacturing Company, and has in it the "million dollar" disc which gives it the snap action. In case the gas flame is extinguished, the disc will close the gas valve in several minutes. The burner under the water heater lights from this safety valve and its heat is controlled by the Robertshaw thermostatic valve.

The body of the range is made of stainless steel, Enduro KA2, Republic Steel Company, and is 34 gauge .008. The burners are cast aluminum. The

(Continued on page 441)

# Making Friends
## The A.G.A. Course in Em

One group from Baltimore. Total enrollment of this company exceeded 700 employees of electric as well as gas divisions.

Springfield Gas Light Co. (Mass.). This group is the second enrollment. A third group enrolled has just completed the A. G. A. Course.

Below—All contact jobs represe
one of several in the St. L

Approximately 2300 employees of the Consolidated Gas Company of New York and affiliated companies were enrolled. This is one group.

This group is from the Malden Gas and Electric Co. (Mass.). Lists of e

# ds for Our Industry

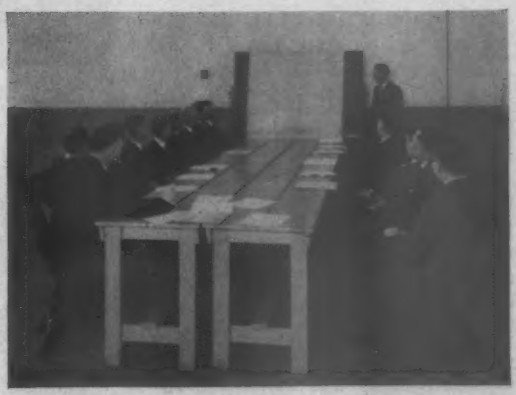
## Employee-Customer Relations

Stamford Gas and Electric Co. (Conn.). One of five conference groups enrolled in the A.G.A. Course.

Nearly one thousand gas and electric employees of the Public Service Electric and Gas Co. of New Jersey completed the A.G.A. Course with the high average grade of 94.2. This is one group.

jobs represented in this group, St. Louis County Gas Co. (Missouri).

The A. G. A. Course is the basis for this clinical study of public relations in the Public Service Company of Colorado, at Denver.



ass.). Men of electric and gas divisions find the course equally useful.

# Gas Makes "The House That Jack Built" Comfortable in Summer and Winter

DURING the last week in August another house equipped with year 'round gas operated summer air conditioning was completed and the equipment put into operation. This house, located in Baltimore, Md., is conditioned in the summer time with a Silica Gel machine of the improved rotary type, which was developed as part of the research in summer air conditioning which has been carried on by the American Gas Association Committee on Industrial Gas Research.

The house was erected by the Roland Park-Montebello Co., real estate developers of the community, and was designed as a display house in the middle-priced field. It featured the latest equipment, not only in gas and electric appliances, but in household furnishings and decorations.

The gas and electric equipment of the house, including the air-conditioning equipment, was sponsored by the Consolidated Gas, Electric Light & Power Company of Baltimore under whose direction the installation was made. The summer air-conditioning equipment was furnished by the Silica Gel Corporation and the winter air-conditioning was furnished by the L. J. Mueller Furnace Co.

This is the first residence in Baltimore equipped to be conditioned throughout the entire year with gas, and has attracted particular attention throughout the city because of that fact. A formal opening was held which was attended by the Mayor of the city, who led about 100 invited guests on an inspection trip through the house.

*"The House That Jack Built." This home is conditioned throughout with gas—summer and winter*

Before officially opening, the Mayor addressed the group of guests, who had assembled on the front lawn, and pointed out the big step forward in summer comfort and health made possible by properly conditioning the air in residences in summer. He predicted the development would prove to be an impetus to the building trades by creating a more active demand for new and improved residences.

Chas. M. Cohn, vice-president of the gas company, in speaking to the guests, congratulated the builders and predicted that many homes in the vicinity would eventually be conditioned throughout the year with gas.

(Continued on page 438)

*Mayor Jackson, of Baltimore, addressing group at formal opening of "The House That Jack Built"*

# Manufacturers' Activities Of Increasing Importance*

By Alexander Forward

Managing Director, American Gas Association

IT is a pleasure to meet with a group of men who, in the most difficult time they have ever known, have resolutely pursued with able leadership a program of trade association work which is bound to have profound results in the manufacturing end of the business and upon the gas industry as a whole.

When Mr. Voliva, of Zion City, predicted that the end of the world will come in 1935, a joking columnist inquired why, considering present conditions, we have to wait that long. Well, in 1935 business will be back upon an even keel and we shall be relatively prosperous.

No one can doubt that we will be proceeding at that time upon bases different in many respects from those of the past. It is equally true that many more things remain to be done before there is a general revival of industrial activity.

None the less, these things will be done. Perhaps never before in the history of the country have so many men with first-class ability been actively at work upon the immense and all-important problems of the times as there are today.

I think it is as appropriate for me to quote Mr. Leigh Whitelaw today as it was in Detroit a year ago. When he was chairman of this Section he expressed the opinion that the lack of a strong organization of manufacturers was a weakness affecting the future of the entire gas industry. That weakness you are transforming into strength for yourselves and for the industry of which you are such an important part.

I congratulate you upon the impress your activities have made upon the industry and upon the increasing importance of your participation in the affairs of the American Gas Association. You are fully represented on the Executive Board, on the Advisory Council, and on many general and sectional committees where you have done great service, and are as much an integral part of the National Association as any other group.

Basically the problems of the gas companies and of the manufacturer companies in our field are identical. We must stand or fall together.

The progress of the plans of the National Advertising Committee of the Range Division has been most gratifying. Nothing but the courage and resourcefulness of Chairman Fry and his associates on the Committee could have brought this proposal to its present stage. Its potentiality means more to the gas industry at this time than any other single development could mean. It would help every one in the industry, the gas companies and other manufacturers included.

Yet by itself it cannot succeed. National advertising, newspaper advertising and direct-mail advertising will scarcely sell a range or bring about a replacement without full cooperation from the operating utility companies and from the other dealers throughout the country. Such cooperation has been fully pledged by the Executive Board of the Association. Here again we must stand or fall together, for the interests of all of the industry are practically identical.

It would be equally impossible for gas companies to promote the sale of gas appliances without the continual improvement in efficiency, control and appearance developed through the never-ending enterprise of the manufacturers.

The Executive Board has set up a National Directing Committee of Executives for the stimulation of sales of ranges and water heaters, and is ready to tie in with your activities.

Obsolete appliances, especially ranges, constitute our greatest handicap. This handicap will be assailed by our joint forces.

I should again say a word about statistics. We have made progress but there is every reason why we should make more progress. There cannot be a real trade association without adequate statistics of the industry which it represents. Work of this kind is always slow in developing and I am not at all discouraged and believe that we will have increasing support of this most important undertaking for the industry as time goes on.

The story is told of a lecturer who exhibited a large and a small skull with the explanation that the smaller one was the skull as a child of the Egyptian king whose mummy and tomb were discovered a few years ago and that the larger skull was of the same king after he grew up. We are arriving at the point where your significance in the industry is greater than when you were young.

* Address before A.G.A. Manufacturers Section Conference, Cincinnati, O., Sept. 29, 1932.

## H. C. Cooper Succeeds Late John B. Corrin

ANNOUNCEMENTS have been made of promotions of officials of the Hope Natural Gas Company, made necessary by the sudden death of John B. Corrin, of Pittsburgh, vice-president and general manager.

*H. C. Cooper*

Howell C. Cooper, of Pittsburgh, vice-president and chief engineer for a number of years and former general superintendent, was made vice-president and general manager. Mr. Cooper was succeeded as general superintendent first by J. J. Evans and later by Wallace B. Gribble of Clarksburg, who now fills the office.

Loring L. Tonkin, of Clarksburg, assistant general superintendent in charge of compressing stations, becomes chief engineer, to succeed Mr. Cooper, and a director in all the companies except the Reserve Gas Company. He will have his office in Pittsburgh.

John A. Clark, of Clarksburg, was made assistant general superintendent, succeeding Mr. Tonkin.

# Low- and Medium-Temperature Semi-Automatic Furnace

*Charging end of gas-fired drawing furnace showing box of work being loaded by hoist onto tray. Note temperature control equipment*

By J. B. Nealey

American Gas Association

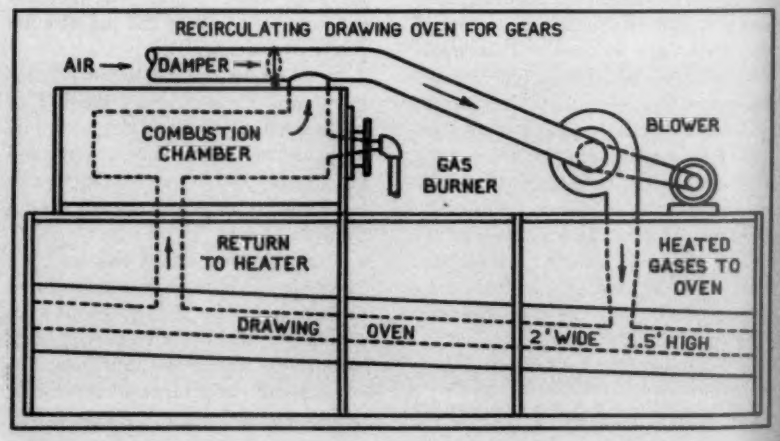
POSITIVE circulation and recirculation of air heated to the correct temperature is the most essential factor in the design of a low-temperature furnace. This is the most effective way of obtaining complete, thorough and continuous distribution of a sufficient volume of low-temperature heat to all parts of the work. When considering a furnace for drawing, tempering, nitriding and other low-temperature work, gas immediately presents itself as the ideal as well as economical fuel.

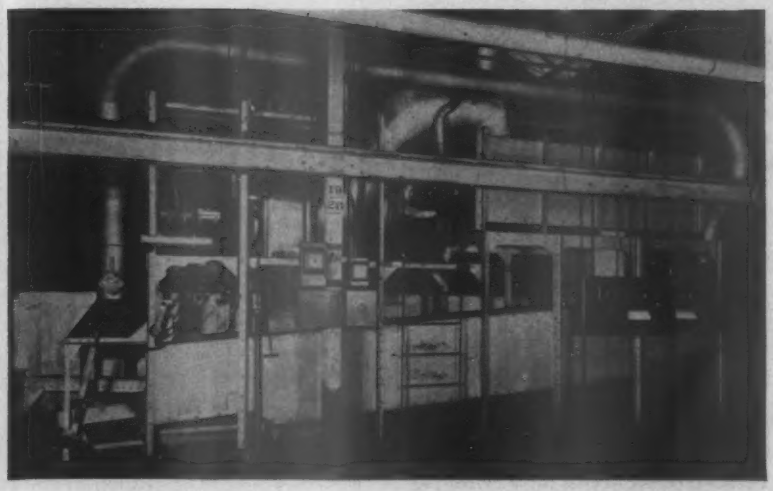
While several different kinds of gas furnaces have been developed for this character of work, they all embody the same method of heating, that of a separate heating chamber, so connected with the furnace by ducts that forced and induced drafts will continually circulate the heated air through both the furnace and heater. A typical installation, which is both ingenious in design and effective in utilization, is a part of the heat treating equipment at one of the plants of the Hudson Motor Car Co., Detroit, Mich.

This unit is employed for the purpose of drawing steel gears at 400° F. and it requires a heating period of 2¼ hours. Consisting of a sheet-steel shell-lined with firebrick, this furnace is 30 ft. long, 3 ft. high and 4 ft. wide and rests on legs. The hearth slopes at an angle so that the work will pass through by gravity. Racks, with upright spindles, on which the gears are stacked, are mounted on casters, and these roll along the hearth from charging to discharging end of the furnace. The racks are kept in a straight line by angle iron tracks in which the casters roll.

At either end of the furnace are a pair of steel, plate doors, just far enough apart to hold one rack, and these form a vestibule which prevents infiltration of cold air or escape of heat while charging and discharging. A unique method has been worked out by which these double doors are operated. A single lever thrown in opposite directions opens and closes each door in turn. The progress of the racks is controlled by dogs actuated by the same lever.

When the furnace is fully charged and closed, the line of racks is held against a dog, protruding through the





*Side view showing separate air heater on top (right) as well as duct system for recirculation and end hoods and exhaust ducts. Note end of roller conveyor (extreme left) for returning trays*

hearth, just in front of the inner door. Throwing the lever in one direction causes the opening of the inner door and the retraction of this dog, so that the first rack rolls forward until stopped by a second dog, just in front of the outer door. At the same time a third dog rises in front of the second rack to hold the line. The lever is now thrown in the opposite direction and this closes the inner door and opens the outer door, retracting the second dog so that the rack can roll out of the furnace. At the same time the dog holding the line is retracted allowing the racks to move forward until stopped by the dog in front of the inner door.

The operation of the double doors at the charging end of the furnace is somewhat simpler. The lever is thrown to open the outer door so that a rack can be charged into the vestibule where it is held by a dog in front of the inner door. The reversal of the lever causes the outer door to close and the inner to open, the dog is retracted and the rack rolls into the furnace.

The heater is mounted on top of the furnace close to the charging end and consists of a sheet-steel shell-lined with firebrick, and well insulated. It is 10 ft. in length and 3 ft. square in cross section. Heat is supplied by a single gas burner located in one end. A duct runs from the top of the heater, back to a point near the discharge end where it enters the furnace through the top. A motor-operated fan, cut into the duct close to this point, pulls the hot products of combustion from the heater and forces them into the furnace, where they flow towards the charging end. As the furnace is under positive pressure and the heater under negative pressure, these products of combustion finally flow back into the heater where they are reheated and recirculated. The excess air pulled in for combustion purposes is relieved through a duct connection between the furnace duct and a stack. Ventilating hoods, connected with the same stack, are provided at both ends of the furnace. The fan is equipped with water-cooled bearings.

The correct temperature of this furnace is mechanically maintained with an automatic temperature controller and recorder, of the potentiometer type. A motor operating a valve in the gas fuel supply line to the burners is intermittently energized by contacts made by the controller so that the valve is opened and closed according to whether the temperature rises or falls from the degree set on the indicator. The contacts are made by a motor in the recorder controller which in turn is operated through the electromotive force generated by the heat to which the thermocouple in the furnace is subjected.

These indirectly heated, gas-fired low-temperature furnaces take the place of the more expensively operated electric furnaces of which there are two types. Both consist of vertical, cylindrical furnaces of steel and brick, each holding a retort surrounded with expensive and easily broken elements. In the first type a motor-operated fan in the bottom causes the circulation and recirculation of the hot air. In the second type the fan is in the side and the retort, which is perforated so that the air can pass through, is rotated with another motor. Lower costs through continuous operation is impossible with these electric furnaces as they are designed for batch work only.

## Classified Trade Association Activities

THE economic importance of the trade association and the value of the activities they carry on as an aid to business are presented in a report by the Trade Association Department of the Chamber of Commerce of the United States, Washington, D. C. The classification of activities contains sixty-eight headings, with a brief description of each. Many of these general activities are broken down into specific phases of work. There are thus more than 200 types of association activity listed. The report includes not only a complete classification and definition of association activities, but also indicates the number of associations, out of 500 reporting, carrying on each particular activity. The report answers these questions:

What are the activities in which associations engage? What is the relative importance of each?

What are the ten most common activities carried on by manufacture and extractive associations?

By wholesaling and by retailing associations?

The classification and definition of activities was developed in cooperation with the American Trade Association Executives.

The National Chamber has held that a trade association should be prepared to consider all problems affecting the general advance of its industry or branch of commerce. This survey clearly indicates that they are actually engaged in activities directed to meet production, marketing, personnel and administrative problems confronting business.

## Arrow on Gas Holder Points Way to Airmen

AVIATORS going to Richmond, Virginia, from the West may find their way to the Byrd Airport by means of a large sign painted atop a big gas holder. The word "airport," with an accompanying arrow pointing the direction, is painted on the roof of the holder, so those who fly may see.

# British Institution Reports on Gas Holder Maintenance

By Herbert W. Alrich
Consolidated Gas Company of New York

IN 1929 the Chief Inspector of Factories for the British Government, in a report of the "Home Office," rendered an opinion that there was "need for the proper inspection of gas holders." The suggestion that the inspection and maintenance of gas holders should be under Government supervision followed as a matter of course. The "Home Office" includes the jurisdiction of a Board of Factory Inspectors of a state of the American Union. Apparently the Chief Inspector did not arrive at his conclusion from any serious happenings, for any important accident to a large gas holder is not easily kept out of the news. No echoes of any such events having been heard on this side of the Atlantic, we may safely assume that the mishaps reported were merely minor incidents in the operation of some small gas holders. However, the Factory Inspection Staff became increasingly active throughout the country in inspecting gas holders, and the operators have been requested to produce such records as they may have that would indicate their routine of inspection and maintenance.

It is stated that the "Home Office" has no special authority in such matters, except insofar as it may obtain a legal declaration that a particular gas holder was in an unsafe or dangerous condition. This procedure apparently corresponds to the American process of "filing a violation," under similar circumstances.

### *Favor More Systematic Inspection*

Following the Government activities, several enterprising insurance companies, seeking a new field for business, proposed new forms of insurance, which, together with the usual fire and public liability risks, would include coverage against damage arising from gas holder accidents, and also a systematic annual physical inspection of the gas holders insured.

While there are no adequate reasons for believing that the maintenance of gas holders is generally neglected, or that the gas industry has done other than fairly well at keeping its own house in order, the Council of the Institution of Gas Engineers concluded that criticism might easily be avoided by a more systematic inspection of all gas holders, the results to be evidenced by a form record. A committee was appointed, with Thomas Hardie as chairman, to report upon the subject, to make recommendations regarding the procedure for inspection and to consider the proposals of the insurance companies. This committee filed its report with the Council in April, 1932. It has now been approved and we have been furnished with copies of the report by J. R. W. Alexander, secretary of the Institution of Gas Engineers.

The report briefly states the matter being handled by the committee, the circumstances of its origin, a discussion of alternative policies, and makes recommendations that take specific form in three appendixes attached to the report.

The gas industry in America will doubtless concur in the view of their British contemporaries, that it is much to be preferred that all work of inspection and maintenance of gas holders be kept entirely in the hands of the operating gas companies. The reasons for this view are almost self-evident. Men within the industry are subject to an educational process which keeps them familiar with their task. They also incur a direct accountability for the proper performance of their duty. Neither of these conditions are likely to apply, in any high degree, to inspectors operating under the Civil Service or in the employ of insurance companies. In any event, many years would pass before such outside inspectors acquired the qualifications necessary to give value to their work. Their competence would always be in doubt. The operating companies could only rely upon the reports from their own men.

### *Perfection Not Yet Attained*

The creation of a system of public inspection could only be justified by such a record of disaster as would support a belief that the gas industry was either unable or unwilling to maintain its structures. History proves the exact opposite of this to be the unquestioned truth, and this statement had equal application to the industry on both sides of the Atlantic Ocean.

We must not say, however, that perfection has yet been attained, and that all of us have done all of the things we should have done. While the available evidence seems to prove that gas holders are as well maintained as any other structures built by the hand of man, on those rare occasions when a mishap has occurred to a gas holder, the public temper has not been reassuring, and has indicated that it will forgive us no errors of judgment.

Appendixes I and II, to the Committee Report, are schedules for daily, weekly, quarterly and annual inspections of gas holders, together with a record of maintenance. The matters to which the inspectors' attention is directed comprehend the entire gas holder structure, together with its mechanical accessories. The arrangement is logical and contemplates the inspector working systematically from the top of the holder down to the ground. One may perceive the extensive experience which guided the preparation of these Appendixes. While there is no actual identity, the general form and outline correspond substantially to American practice, with the exception that the customary routine in America is more readily classified into daily and annual inspections, there being form reports for these only.

The report of the committee does not require the making of observations for the location of obstructions in the bottom of a holder tank.

(Continued on page 441)

# Affiliated Association Activities

## Pacific Coast Gas Association

*Harry L. Masser*

THE thirty-nineth annual convention of the Pacific Coast Gas Association attracted an attendance of more than 300 members to Del Monte, Calif., August 24-26. Harry L. Masser, vice-president and executive engineer of the Los Angeles Gas and Electric Corporation, was elected president; George P. Egleston, general manager of the H. R. Basford Company, San Francisco, vice-president; and D. G. Martin, auditor of the Pacific Gas and Electric Company, San Francisco, treasurer.

New Directors elected to the Board follow:

H. M. Thomas, Northwest Cities Gas Company, Walla Walla, Washington; C. H. Potter, Southern Counties Gas Company, Los Angeles, California; Don C. Ray, Pacific Gas and Electric Company, San Francisco, California; and Andrew Kerr, Steiger & Kerr Stove & Foundry Company, San Francisco, California.

The following section chairmen were appointed for the year:

Accounting Section, R. N. Dreiman, Pacific Public Service Co., San Francisco; Advertising & Publicity, F. H. Holden, Southern California Gas Co., Los Angeles; Commercial Section, F. U. Naylor, Pacific Gas and Electric Co., San Francisco; Manufacturers' Section, R. L. Hinckley, General Water Heater Corp., Los Angeles; Public Relations Section, D. L. Scott, Los Angeles Gas and Electric Corp., Los Angeles; Technical Section, Guy Corfield, Los Angeles Gas & Electric Corp., Los Angeles.

Amendments to the constitution were made, setting up a Manufacturers' Section in the association which will cooperate with and act as a Pacific Coast Division of the Manufacturers' Section of the American Gas Association. R. L. Hinckley, president of the General Water Heater Corporation, Los Angeles, was appointed as the first chairman of this section.

The Addison B. Day Medal of Honor was awarded to Frank Wills, engineer of production of the Pacific Gas and Electric Company, San Francisco, for his work as chairman of our Gas Engineers Handbook Committee and for excellent papers presented to the industry during the last two years on burner design, design of vents and flues, and flow of gas in pipes.

The Association's Gold Medal was awarded to R. E. Fisher, vice-president in charge of public relations and sales of the Pacific Gas and Electric Company, San Francisco, for his work in business development and dealer relations; to R. A. Hornby, executive engineer of Pacific Lighting Corporation, San Francisco, for his paper on pension systems; and to J. A. Harritt, superintendent of production of the San Diego Consolidated Gas and Electric Company, San Diego, and Frank Wills for their participation in a paper on "High Heating Value Oil Gas," which was written in collaboration with L. J. Willien, gas engineer of the Byllesby Engineering and Management Corporation, Chicago. Mr. Willien was not awarded a Gold Medal because he was not a member of this association but he was unanimously elected as an honorary member.

## Convention Calendar

*October*

**3- 5 American Society Testing Materials**
Buffalo, N. Y.

**3- 7 National Safety Council Congress**
Washington, D. C.

**4- 5 Indiana Gas Association**
French Lick, Ind.

**10-12 AMERICAN GAS ASSOCIATION**
Atlantic City, N. J.

*November*

**1- 2 Institution of Gas Engineers**
Annual Research Meeting, London, England

**15-17 American Petroleum Institute**
Houston, Texas

## Wisconsin Utilities Association

DEALER cooperation and means for increasing the gas and electric loads were the themes which ran through the sessions of the Wisconsin Utilities Association annual commercial conference which was held at Eau Claire, Wis., August 25 and 26. Under the leadership of chairman R. O. Jasperson, of Milwaukee, more than 125 utility commercial men and visitors from throughout the State listened to experts discuss plans for business building and more effective means of selling gas and electric merchandise.

Particular interest was shown in the addresses of representatives of three groups of Wisconsin merchandisers,—Wisconsin Master Plumbers Association, Wisconsin Retail Hardware Association and Wisconsin Electrical Contractor Dealers Association. It was judged by these talks and from the discussions which followed from the floor that the utilities and dealers of the State are getting closer to mutual ground although some details have yet to be fully agreed upon.

The papers included presentations on competitive forces, air conditioning, salesmanship, and a report by the gas utilization committee.

Addresses were given by E. D. Milener of the American Gas Association on "Recent Trends and Developments in Utilizing Industrial Gas" and by C. E. Greenwood, of the National Electric Light Association, on "Is Legislative Reprisal the Way Out?"

Entertainment was furnished by groups of men and women employees of the Northern States Power Company. At the conclusion of the conference a golf tournament was held which was participated in by a number of the visiting delegates.

## Oklahoma Utilities Association

MANAGER Edward F. McKay, of the Oklahoma Utilities Association reports that, notwithstanding reduced operating revenue this year, all activities of his Association are being carried on, some on a curtailed basis, others normally and some more intensively than at any former time.

The judicial bulletin and news letter are being issued alternate weeks instead of both each week. Except for inability to convey to the member companies as much information as formerly in the judicial bulletin, the usefulness of that publication has been unimpaired. Amount of copy from the news letter used by newspapers appears to have been affected little by the less frequent issuing of the copy. Discussion of specific matters in daily and other papers has been more frequent and the audience reached by the letters is said to be more extensive than previously.

Study of the municipal tax levies of cities and towns of the State, approved by the executive board on recommendation of the public policy committee, was completed and the schedule of municipal levies was issued as of June 30. This was followed by compilation of municipal appropriations for all cities and towns of the State, totals being broken down into expenditures by various municipal and administrative departments for the purpose of comparison. This compilation, comprising 53 typewritten pages of tabulation, was issued as of July 15.

These compilations, and exhibits since issued on information available in them, were sent to managers of utility information committees, national utility associations, and some utility journals, and letters received indicate that they have been of value in combatting municipal ownership.

## Natural Gas Department

T. J. STRICKLER, Chairman — A. E. HIGGINS, Secretary — L. K. LANGDON, Vice-Chairman

# Southern Gas Company's 80-Mile Pipe Line to San Diego Completed

THE Southern Counties Gas Company of California has completed its eighty-mile, 12¾" diameter gas pipe line from Huntington Beach, Orange County to Rose Canyon in the city of San Diego. Gas will be delivered to the intake of the line at Huntington Beach at the Industrial Fuel Supply Company's compressor plant which is connected by a system of transmission mains to all of the important sources of natural gas in Southern California including the Kettleman Hills field, and will be metered and delivered to the San Diego Consolidated Gas and Electric Company, at the Rose Canyon terminus.

Two years ago when the Southern Counties Gas Company extended its gas transmission system twelve miles south from Laguna Beach to serve San Clemente, it anticipated the ultimate delivery of natural gas to San Diego County cities, and installed a 12¾" high-pressure main. This 12-mile section has now become a part of the new eighty-mile transmission line.

Thirty-five miles of the line extending from Huntington Beach, to the Orange County line southeast of San Clemente were installed by the Southern Counties Gas Company's own construction forces, largely by hand labor. The forty-five miles in San Diego County and city were installed under contract by Lindgren & Swinerton, Inc., of Los Angeles.

For about one-half of the distance, the line is laid on private rights-of-way. The line pipe is 12¾" O.D. plain end steel pipe and weighs 34.552 pounds per lineal foot, except where it is laid under water in six salt water marsh and channel crossings. A total of more than two miles of 12¾" O.D. steel pipe with a ⅜" wall thickness, weighing 81 pounds per lineal foot, was installed in these crossings. In addition to the six channel and marsh crossings, six rivers and creeks were crossed on highway bridges and several deep barrancas were crossed by spans of approximately 100 feet each.

Field welds on the San Diego County section were made by the electric arc method, using streamlined chill-rings. On the Orange County section, the field welds were made by the oxy-acetylene Linde process. All angles are mitered with the exception of those in exposed pipe on bridges where tube-turns were used. All welds were required to develop the full strength of the pipe, which was checked by tension tests in the field.

Spur gear operated Venturi-type plug valves with 6" blow-down valves were installed approximately every five miles. No expansion joints were installed except at each end of marsh crossings where the ⅜" wall pipe is connected to the lighter pipe.

A careful soil survey was made to determine the corrosivity of the soil along the route of the line and several types of protective coatings were used.

Where the pipe was exposed to the atmosphere, as on bridges and spans over barrancas, and also where it is submerged in salt water at channel crossings, the pipe is galvanized. All welded joints in galvanized pipe are protected with a coating of zinc ten one-thousandths of an inch thick, applied by metal spray process.

Sixteen miles of the new line are protected with a coating of hot asphalt double wrapped with rag felt applied by machine at the point where it was unloaded from the railroad cars.

Thirty-six miles are protected with coal tar and wrapped with asbestos pipe wrapper applied in the field. Hand operated field wrapping machines were used in applying the asbestos wrapper on part of the thirty-six miles. Twelve miles were laid bare in non-corrosive soil.

The line is divided into sections with insulated couplings and cathodic protection will be employed in sections installed in corrosive soil.

Work was started on the Orange County section May 3, and was completed August 23. Work on the San Diego County section was started June 6 and was completed August 26.

The line has a capacity of 24,000,000 cubic feet per 24 hours. With the present compressor equipment, this capacity may be increased to 30,000,000 cubic feet per day by the addition of a booster station, if required.

The cost of the line complete, without compressor stations, amounts to approximately $1,000,000.

# Carbonizing Properties of Pittsburgh and Alabama Coals

THE sixth and seventh reports on the cooperative carbonizing studies of the United States Bureau of Mines and the American Gas Association have been issued recently by the Bureau of Mines.

The sixth report, Technical Paper 525, entitled "Carbonizing Properties and Constitution of Pittsburgh Bed Coal from Edenborn Mine, Fayette Co., Pa.," by A. C. Fieldner, J. D. Davis, R. Thiessen, E. B. Kester, W. A. Selvig, D. A. Reynolds, F. W. Jung and G. C. Sprunk, covers the same coal that is carbonized in the largest coke oven plant in the world —the famous Clairton plant of the United States Steel Corporation. The results obtained with the Bureau of Mines—American Gas Association apparatus were in good agreement with those obtained in practice at the coke plant, thus affording further corroboration of the practical value of this method for appraising the gas- and coke-making properties of a coal. With this and subsequent coals, the test program was enlarged to include coking experiments with 18 inch diameter retorts as well as the standard 13 inch retort previously used. The larger retort affords additional information on the physical properties of the coke—an important consideration in connection with the production of domestic coke.

The seventh report, Technical Paper 531, entitled "Carbonizing Properties and Constitution of Black Creek Bed Coal from Empire Mine, Walker Co., Alabama," by the same authors, gives results on a high volatile coal from Alabama, on which practically no carbonizing information has been available heretofore. The tests showed that this coal deserves high rank as a gas coal. The yields at gas-making temperatures were coke, 67 per cent; gas, 12,000 cu.ft.; B.t.u. per lb. coal, 3400; tar, 12 gal.; light oil, 3.7 gal.

The investigation of the Black Creek coal is an example of the application of this survey to new coals not commonly used in the gas industry.

## Home Service Committee

HULDA UNGERICHT, Chairman — JESSIE MCQUEEN, Secretary

# Load Building and Kitchen Planning*

By Ruth H. Kleinmaier

Central Hudson Gas & Electric Corporation

ONE night, about eleven o'clock, my telephone rang and upon answering I heard a voice on the other end of the wire saying "Hello, this is Mrs. Smith. I don't know if you remember me, but you planned my kitchen for me and now that it is all completed I would like to have you come over and see it." The conversation ended by my making an engagement with her for the next evening at eight o'clock. Upon my arrival the proud owners of this new kitchen were out of doors waiting for me. Just as we were going into the house two friends of theirs arrived to see the new house and particularly the kitchen that they had heard so much about. We all went into the house and Mrs. Smith informed us that she would show us the rest of the house and then the kitchen—keeping the best until last.

This incident interested me very much as it gave me a chance to see what happens in these kitchens we have planned, when we are not around. After the many Oh's and Ah's from the guests, the hostess proceeded to demonstrate her kitchen. When she came to her range she went into it thoroughly from the surface burners to the automatic oven control. From her range she went to her sink and turned on the hot water and explained what a great convenience it was to her.

I couldn't help but think how much more influence this had on her friends than a dozen classes given in our auditorium. From Mrs. Smith's conversation I knew that she had gone over this same demonstration of her kitchen to many other friends.

"Load Building and Kitchen Planning!" I wonder if I might change that subject to "Friend Building and Kitchen Planning." We used to hear a great deal about how to show that the utility companies were justified in maintaining a Home Service Department. It was agreed that the actual results obtained far surpassed the tangible results. The incident I just mentioned shows that the same thing is true in kitchen planning. We have found that every woman who has a plan made for her and makes use of it is a real friend of ours. She is just like an efficient salesman out in the territory, selling appliances, selling people whom we would never be able to reach.

I do not say that the load (or rather the customer's use of our service) is not increased by these Kitchen Plans because there is no doubt that it is. I had a case the other day that shows directly how these Kitchen Plans help increase the service. The plans were drawn up for this particular customer, Mrs. Green, and presented to her. Perhaps I had better explain just how these books are produced. They are bound in an attractive green cover and a picture of the customer's house is mounted on the outside. As we open the book, on the first page is printed the statement that this book is prepared for Mrs. Green, Milton, N. Y., by the Home Modernizing Bureau. The next page contains a print of the kitchen plan drawn to scale with all of the appliances placed. We then have an architect's sketch in color showing how the kitchen will look when completed. This is followed by pictures of the various appliances to go into the kitchen, including those to be purchased and the ones the customer now has. We then have, if the customer desires, a page containing the cost of the work to be done, including the appliances, floor and wall covering, cabinets, etc.

### *Shows Load-Building Factor*

Just such a book was presented to Mrs. Green. The thing that seemed to interest her most in the plan was the fact that we had pictured a kitchen cabinet exactly like hers. What effect did that have on the load building? When they purchased their refrigerator and it was delivered they compared it with the one in the book. The salesman had sold them a smaller one and they had him take it back and bought a larger refrigerator.

While this incident directly shows the load building factor, it also brings out that of "Friend Building." This customer, now that she has the proper size appliances for her family, will be much more satisfied than if she had one that was too small for her needs. Now she will be anxious to tell her friends about her kitchen and the service she has received from her new equipment and from the utility company.

Why not, instead of that old saying, "Come out of the kitchen," change it to "Come into the kitchen." There certainly were plenty of reasons why we used to say come out of the kitchen. Picture a kitchen that has dark colored walls and dark linoleom on the floor to prevent the smoke and dust from the coal and wood showing. Or perhaps it is a wooden floor with those grease spots on that just will not come out no matter how hard you scrub. The big black range occupies about one-third of the kitchen and, of course, there is the stove pipe that certainly does not help to make the kitchen attractive. In one corner is an iron sink with a hand pump on one side of it. Remember the wood box at the side of the stove that was always empty just when you needed it most and then the dirt that you brought in when you had to stop your cooking and go out into the wood shed for another armful. Can you blame anyone for wanting to get out of that kitchen? You may think that very few of those kitchens exist where we have gas lines today. Suppose we step into what we find to be an average kitchen in our territory. The coal range is replaced by a combination gas and coal range. The walls and linoleum are dark, as we still get dirt from the coal range. The oven has no regulator and the cake has to be turned a half dozen times to prevent it from burning. A water boiler is standing by the side of the range. There are no cabinets in the room, they are off in a pantry on the side, which also adds an extra door in that kitchen. The sink is over in one corner without a drain board of any kind. There is a table somewhere in the room. You will find five doors in the average kitchen leading to the hall, the pantry, the dining room, the cellar and an outside door. Everything is placed without rhyme or reason. If we should see that room I think we would still say "Come out of the kitchen" and that is just what Mrs. Customer does. She goes down to the store and buys her cake and canned goods, anything to get out of that kitchen. What happens to the load building? What happens to the friend building? Certainly she has nothing to tell her friends about, unless it might be that she bought a cake down at the store instead of making one because she wasn't going to stay in that kitchen and bake, even though the store cake wasn't as good.

### *Paving Way for Salesman*

Now let kitchen planning enter into the picture and see what happens.

The Home Service representative has heard that Mrs. Jones is considering the purchase of a new combination coal and gas range, so she calls on her to see if she can be of any assistance to her in planning the placing of the range or in suggesting a color scheme for the kitchen. Before she leaves she has taken the measurement of the kitchen, told Mrs. Jones the advantages of a gas range over a combination range. Mrs. Jones' objection was that she heated her water with the coal range and she would have no way to do it. The Home

*As given at the Combined Course in Gas Appliances and Home Service Conference at A. G. A. Laboratory, Cleveland, Ohio, June, 1932.

Service representative tells her all about the automatic gas water heater and how it can be placed in the basement, thus improving the appearance of the kitchen. All of this helps to pave the way for the salesman when he arrives. When the completed book is delivered to the customer she is sold on the idea of going ahead with the plans as they are presented in the book. The combination range is replaced by a new automatic gas range. The automatic water heater is in the basement. Her kitchen is rearranged to give her convenience, and what an attractive kitchen Mrs. Jones now has. The results are the same as we have already seen with Mrs. Smith. Mrs. Jones' friends too come and see this modern kitchen. They go out and tell their friends about it. Over many a bridge table you will hear an enthusiastic friend telling about the wonderful new range Mrs. Jones has in her kitchen and that she never has to worry about having plenty of hot water on hand. Thus they are out selling for us.

Just as the proud owner of a new kitchen says, "Come into the kitchen," so I think we can say in our work, "Go into the homes." Here we meet the housewife on common grounds and can discuss her own personal problems with her. With the aid of a Home Modernizing Bureau, we are able to give her a real service, one that she is proud to tell her friends about. You notice I just mentioned Home Modernizing instead of Kitchen Planning. I do not think we should confine our services to the kitchen. What about the bathroom where quantities of hot water are used, or the laundry? I believe we can broaden our scope from the kitchen to include the entire home.

By a method such as this we give Mrs. Housewife a Modern Kitchen which is in itself an invitation to enjoy the most attractive room in the house. It is her pride and joy. Her friends are entertained there. They see the gas range and the automatic water heater in action and a desire is created in their minds to have a similar kitchen. Before they were perfectly satisfied with what they had.

It is with the use of methods such as these that will keep the gas industry going forward. We cannot be satisfied with conditions as they used to be or as they are today but must keep looking ahead for new ideas and new friends.

## Home Service Booklets

*Inside Activities*—The third of the series of home service booklets called "Inside Activities" is now available from the American Gas Association, 420 Lexington Avenue, New York, N. Y., at a cost of 10 cents. This booklet has been prepared by a subcommittee of the Home Service Committee directly in charge of its chairman, Ruth Soule of the Brooklyn Union Gas Company. It outlines the activities carried on within the company's quarters under the headings of lecture demonstrations, sales floor kitchens, individual cooking classes, experimental or test kitchen, special groups and clubs and inter-department courses.

*Outside Activities and Home Calls*—These are the first two booklets of the home service series and likewise are available at Association Headquarters for 10 cents a copy. The one on *Home Calls* lists not only the types of home calls but the specific directions for taking care of them in the homes of the customers. The one on *Outside Activities* considers the activities which take place outside of the company's quarters and the table of contents includes clubs and societies, education, cooperative cooking schools, public centers, cooperation with other outside agencies, miscellaneous demonstrations away from company property. The fourth booklet, *Aims, Organization and Publicity*, is now nearing its final form and will be available in October.

## Gasettes

The Home Service Department of the Consolidated Gas Company of New York has issued this summer a guide for canning fruits and vegetables. It is well illustrated and has been indexed in such a way as to allow the user to immediately turn to whichever canning method she desires to use. Copies are available by writing to Miss Althea Lepper, home service director.

The home service directors in the home economics department of the Public Service Electric & Gas Company, under the direction of Ada Bessie Swann, are continuing their monthly staff meetings, the first one in the fall being held September 27. At these meetings the directors from the district offices meet together with Miss Swann and outline in detail the activities for the month so that work may be uniformly carried on in all the branches.

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The home service department of the Boston Consolidated Gas Company has conducted a series of homemaker's three-day forums in its five district offices. Demonstrations in cookery, laundry and personal beauty hints comprised the program and on the third day of each series a gas range was given as a prize award. Daily drawings were made for the food prepared during the demonstration. Because of the encouraging response to these schools the plan of schools will be repeated in the fall program. Miss Daurice Darling, home service director, reports also another activity in her department in the placing of homemaker's columns in thirty-six weekly newspapers throughout the suburban district served by the Boston Company.

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Mrs. Lyda Flanders, home service director of the Worcester Gas Light Company, reports a form of dealer cooperation by which she will conduct a series of demonstrations in the auditorium setup on the sales floor of a Worcester furniture company. For several years past Mrs. Flanders has participated in the Blue Star Home arrangement of a Worcester lumber company. A house of four stories was built by the Sawyer Lumber Company and each room carefully planned as to furnishings, useful equipment and attractive arrangement. The demonstration kitchen is in the basement and yet it has five full-size outside windows. The gas boiler, incinerator, space heater and meters are also on this floor so that visiting classes can readily see them. The home service department of the gas company has the entire use of the house at its disposal for group meetings and the demonstrations given in this home have been well attended.

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## N. J. Engineering Handbook Proves Success

THE *Engineering Handbook for Building Heating by Gas* which was prepared by the Industrial and House Heating Committee of the New Jersey Gas Association, of which H. P. Morehouse, Public Service Electric and Gas Company, Newark, was chairman, has been favorably received both by representatives of public utility companies and by representatives of manufacturing companies. Although the handbook has been in printed form only a few months, more than 500 copies have been distributed. Orders have been received from all parts of the United States and from Canada, Mexico, Sweden and New Zealand.

The purpose of this pocket manual, which is in loose leaf form, size 6¾ x 3¾ inches, is to provide in one volume the engineering data necessary to figure practically all jobs in the field. It contains ninety pages, with a wide variety of tables and charts.

Although many of the pages are condensed from existing manuals, they have the advantage of presenting the most needed information in compact form and it is this feature that has appealed so strongly to the many engineers who are now using the book.

The handbook includes chapters on "Determination of Heat Loss in Buildings"; "Steam and Hot Water Heating"; "Warm Air Heating"; "Estimating Gas Consumption"; "The Automatic Gas Burner"; "Domestic Water Heating"; "Industrial and Commercial Building Heating"; "Data and Other Fuels"; and tables and miscellaneous information.

## Publicity and Advertising Section

WILLIAM H. HODGE, Chairman ALLYN B. TUNIS, Secretary HENRY OBERMEYER, Vice-Chairman

# Seattle Gas Company Captures Advertising Award

FOR the "best advertising in newspapers," during the year, the Seattle Gas Company, Seattle, Wash., received the much-sought award of the Pacific Coast Gas Association at the 1932 convention held in Del Monte, Calif.

Other awards announced at this time were:

Best Dealer Relations Advertising in newspapers—Southern Counties Gas Co.

Best Institutional Advertising in newspapers—San Diego Consolidated Gas & Electric Co.

Best House Organs—Southern California Gas Co.

Best Outdoor Advertising—Southern Counties Gas Co.

Best Direct Mail Advertising—Pacific Gas & Electric Co.

Advertising Sweepstakes for the best all-around advertising—Southern Counties Gas Co.

The judges of these awards selected five pieces of newspaper advertising which in their opinion were the five best in the display. Women of the convention voted on the five that they considered the best. Prize for the selection which most nearly agreed with the selection of the judges was won by Mrs. Ike Adams, of San Jose, who received ten dollars in gold. The second prize was captured by Mrs. John S. Spaulding, of Los Angeles, who was rewarded with five dollars in gold.

Of the five pieces of copy selected by the judges, three were produced by the Seattle Gas Company and two by Southern Counties Gas Co.

In the women's voting on the advertising, Southern Counties Gas Company won first place, Southern California Gas Company, second and Pacific Gas & Electric, third.

# Timely Touch for Window Display

*Above is shown how the Consolidated Gas Company of New York injects a topical note in a window display*

# Rental Scheme of House Heating

THE Union Gas Company of Chatham (Ont.) is featuring, through its various offices, a new household heating unit rental system which is designed to popularize domestic heating by gas.

Under the rental scheme, the customer is under no obligation to buy costly heating equipment. The company installs, maintains and services the equipment free, subject only to a rental of $12 a year, with payment for the gas used at regular rates. An aggressive campaign for developing domestic heating business on this basis has been launched, announced at the outset by full-page advertisements in local newspapers.

## Laboratory Holds Annual Picnic

MEMBERS of the A. G. A. Laboratory staff, their families and friends, enjoyed a day of play and recreation at the Big Ten Alumni Country Club, Cleveland, Ohio, on September 9. The men's and women's golf and tennis tournaments were the chief attractions during the day, followed by various other sport events and contests including an egg-throwing contest, which was enjoyed by the participants until the eggs were broken.

A banquet was held in the evening followed by dancing in the club ballroom.

R. M. Conner won first prize for the lowest gross score in the men's golf tournament, while J. R. Kinkaid took the prize for the lowest net score. Miss Icona Andrews took first prize in the women's golf tournament. Mrs. Molly Rutherford was the winner in the women's tennis matches, while J. A. Leighton won in the men's tennis tournament.

## Oklahoma Gas Corp. Publishes Historic Map

AN historical map, graphically portraying vital portions of Oklahoma history, has been prepared by the public information and map department of the Oklahoma Natural Gas Corporation for distribution to interested persons.

Data for the map, which contains all important incidents which combined to widely develop Oklahoma, was obtained by the public information staff of the gas company. The map was drawn by Harry Z. Sanders.

## Accounting Section

Wm. A. DOERING, Chairman — H. W. HARTMAN, Secretary — J. M. ROBERTS, Vice-Chairman

# Mechanical Office Equipment To Be Discussed at Convention

ACCOUNTING section members who are planning to attend this year's convention at Atlantic City, N. J., have been invited to be present at the meeting to be held October 11 at 2 P.M. in Haddon Hall, at which time the Accounting Section Committee on Mechanical Office Equipment will present its report.

Perhaps the most unusual paper to be presented by the committee will be the report on "Wrinkles." This report will show a variety of interesting ways in which office economies may be effected. The information for this report was gathered by means of a survey conducted among member companies in our association and among office equipment manufacturers. From the responses made, fifty of the most interesting and profitable office efficiencies were selected to form the report.

Innumerable problems, which continually confront the gas executive receive consideration in the report. The "other fellows" pet ways of dealing with the common problems of the gas industry's offices are brought to light.

To illustrate, a survey of addressing information inserted on service bills used by twenty-four utility companies indicated that fifty-four items of information are shown on the various addressing plates and stencils. Ten different styles of type are used. In some instances two styles are used on one plate. Economies undoubtedly can be effected here by the use of only one style of type and elimination of unessential data.

Have you ever attempted to simplify your payroll procedure? A simple but effective method of reporting, recording and distributing labor time is outlined in the report.

Are you experiencing difficulty in keeping your meter life records? Six plans for meter life records are presented in the report, each plan accompanied by exhibits of the forms required.

In all, there are fifty such "Wrinkles" included. The utilization of any of these may result in substantial savings in labor and time.

Accounts payable will also be discussed at this meeting. The Subcommittee on Accounts Payable Plans will present nine plans. Exhibits of the forms used in connection with each have been prepared. The pros and cons regarding the merits of the "one-time" and "built-up" vouchers should furnish an interesting discussion.

In addition, at this time, John M. Kramarsik, of The Connecticut Light and Power Company, New Haven, Connecticut, chairman of the Subcommittee, will present the report on "Distribution and Photo Strip Accounting." This is a comparatively new approach to the problem of account record keeping. It is a procedure for sorting, summarizing and accumulating a large number of different items to a smaller number of groups or accounts and creating a record by the use of photography. The subject is variously known as the peg-board, peg-strip, clip-strip and shingle-strip method.

In the report on mechanical office equipment, the committee has not attempted to answer the question, "what is the best machine for this or that purpose?" It has steadfastly attempted to favor no particular type or make of machine. Pursuant to this policy, in the report on "Accounts Payable Plans" no particular plan is endorsed, instead a complete picture has been attempted in each case. Any decision as to the best machine or best system must come from the individual.

Members attending the meeting will have ample opportunity to discuss the reports. It is hoped that they will be able to take back with them some new ideas which will be beneficial to the companies they represent.

## Safety Items

FIRST honors in a national safety contest for large manufactured gas companies were won on the 1931 record of the Citizens Gas Company of Indianapolis, Indianapolis, Ind., according to announcements made by the National Safety Council. This company also was placed second for its safety record among all public utility companies of the country.

The Citizens Gas Company's plant employed 662 persons for a total of 1,315,000 hours last year, without the loss of time by any employee on account of injury. The record was second in the national public utility classification of safety council rating to the St. Louis plant of the Southwestern Bell Telephone Company, which employed more than 1,000 men for a total of 2,549,000 hours.

## Gas Invented By Devil?

**The amazing growth and expansion of the gas industry can better be realized when one recalls that about a century and a quarter ago people believed that gas was the devil's invention and were afraid of it. In fact, the word "gas" was evolved from the original "geist" in German, meaning "ghost." When Frederic Winsor in about 1804 proposed to light the city of London with gas, his plan was characterized by Napoleon as "a great folly." Sir Walter Scott declared that "a madman proposes to light London with smoke." But Sir Walter was a progressive person and later became a director of the first London gas company, which was organized about 1820.**

## Pacific Coast Utilities Set Up Retirement Plan

**A PACIFIC Coast utilities group, embracing the Southern Counties Gas Co., the Los Angeles Gas & Electric Corp., the Southern California Gas Co., the Santa Maria Gas Co., and others have entered into a cooperative old-age retirement pension plan for employees, which is said in insurance circles to be one of the most comprehensive instituted this year by any American industry.**

**The plan, which affects every employee of the company, provides for a retirement income for men after the age of 65 and for women after 60. It also provides for disability income prior to retirement and for life insurance should death occur during employment.**

**Retirement income is based on years of service and the annual wage or salary while employed. The life insurance provided in the new plan is equivalent to one year's pay when regularly employed.**

**The employee of average income will be protected by a policy of $2,500 and will receive from $65 to $75 a month for extended illness or disability.**

**The plan fund is created by money provided both by the employees and the companies.**

## Industrial Gas Section

W. F. MILLER, Chairman C. W. BERGHORN, Secretary

# Our Industrial Gas Practices Through European Eyes*

The American Gas Association, through the kindness of Major Alexander Forward, managing director, has presented to the library of the Institution of Gas Engineers its industrial gas series of reference books, which can be inspected in the library of the Institution.

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THOSE of our readers who have copies of the two most recent publications in the Industrial Gas Series of the American Gas Association—*Water Heating* and *Combustion* will realize how badly served is our own industry in this respect. We have nothing to compare with the information which is disseminated by the A. G. A. on any and every aspect of gas affairs. We know that some people speak pridefully of "British Muddling Through" but we are of those who prefer planning to muddling. So far, the gas industry has adopted the muddling method, which has gained a certain amount of ill-merited credit owing to the absence of opposition. Muddling will not carry us through the fight with electricity, and the longer we persist in sticking to the methods of the past, the greater will our casualties be. Why not cast aside all petty jealousies, close the ranks and constitute ourselves into an efficient fighting force, armed with the most modern weapons which have been devised? It can, and should be, achieved if only a few men of goodwill will get together and set the machinery in motion.

It is time that we stopped guessing and took to precise knowledge. There is an enormous field for the expansion of the gas business in the face of all competition—industrial, water heating and space heating have as yet scarcely been scratched—but we shall not win the fight for that business with several disorganized and ill-equipped armies each fighting under a separate leader. We need a single gas army under the direction of a general staff which would reorganize the whole system until it became an efficient fighting force. In a large measure the future of the gas industry is bound up with the establishment of a British Gas Association and in our opinion the sooner that fundamental reform is completed the better will it be for the security of the industry.

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*Abstracts from recent issues of "The Gas World" (London) by A. Gordon King, industrial gas engineer, American Gas Association.

*Combustion—A REVIEW by "Protens"*

THE third edition, has been rewritten completely and covers a much wider field than its modest title suggests. It, not only provides data for the calculation and control of heating processes and furnaces, but also gives information, which will enable the industrial engineer to meet the competition of other fuels. It goes beyond the elementary reactions and includes the disassociation of gases and flame temperature for which constants and formulae are given. It has been a happy thought to include also a chapter on heat transfer, which is actually outside the immediate scope of the book, but a subject engaging the widest interests.

Chapters 7 to 9 deal with furnace appliances and cover gas burners, furnace equipment and temperature control. Although primarily written for American conditions, the subject will be equally instructive to British engineers on account of the valuable practical information given in the form of tables and charts. The performance is discussed of a number of burners working under different conditions of pressure and on various types of furnaces. Special mention is made of air and gas mixers, to which more attention seems to have been given in America than in this country. They are no doubt important from the point of view of combustion itself as well as of the furnace atmosphere, which has also received appropriate consideration under "Heat Salvage Methods" (Chapter 10), where recuperators, regenerators and waste heat boilers are discussed. Recuperators are apparently preferred to regenerators, which are complicated by problems introduced by dust and the rate of deterioration of the checker work. Waste heat boilers are considered to have received too little attention in the past, but are thought practical for many industrial furnaces, if adequately designed.

The comparative cost of fuels is stated without bias and should prove a valuable guide to gas salesmen, who will be enabled in the first place to obtain for themselves a clear conception of the respective values of the different fuels and secondly to prepare data based on facts, which, when placed before prospective customers, are stronger arguments than persuasive words.

The publication must be pronounced a laudable effort, which deserves the wholehearted support of the gas industry in this country.

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## More Gas Sold In Great Britain

EXPRESSED in percentage, the increase in the quantity of gas sold in 1931, as compared with 1930, in Great Britain may not be very substantial, but in actual amount it is quite considerable. The Board of Trade official Return shows that the quantity of gas made (including gas bought from coke ovens) by the 749 undertakings included in 1931 was 707 million cu.ft. (0·2 p.ct.) more than the amount for 1930, while the quantity sold increased by 702 million cu.ft., or 0·2 p.ct. The quantity of gas sold in 1930, as compared with 1929, showed a falling off of just under 1 p.ct. The results recorded for last year should be a source of encouragement to all concerned, as affording an indication of what may be expected with a return to more prosperous times. The figures are valuable for the refutation they provide of the assertions advanced from time to time that gas is a dying industry.

The number of authorized undertakings included in the Return compared with 767 for 1930, bears the mark of present-day policy in the Gas Industry. During the twelve months under review, ten gas undertakings have been absorbed by others. The total number of therms sold by all undertakings during 1931 was 1,389,826,798. The total quantity of gas sold in the past year was 290,693 million cu.ft., while the figures for the preceding twelve months were 289,991 millions. The sales to prepayment consumers in the year increased from 107,964 million cu.ft. to 110,510 millions; the sales to ordinary and power consumers, &c., reflect to some extent industrial conditions by a reduction from 170,737 million cu.ft. in 1930 to 168,394 millions in 1931; the quantity of gas sold for public lamps in 1931 increased from 11,288 million cu.ft. to 11,787 millions.

# Obituary

*J. B. Corrin*

JOHN B. CORRIN, 63 years old, of Wilkinsburg, Pa., vice-president and general manager of the Hope Natural Gas Company, died suddenly August 27, at a hotel in Clarksburg, W. Va. Death was caused by a heart attack.

Mr. Corrin went to Clarksburg to attend the annual picnic of the Hope Natural Gas Company employees and Reserve Gas employees.

Funeral services were held in the First Presbyterian Church of Wilkinsburg. Active pallbearers were selected from his fellow-employees of the Hope Natural Gas Company in Pittsburgh and Clarksburg and included the following: F. O. LeRoy, J. W. Kidd, J. M. Low, J. C. Chisler, L. M. Ayers, J. C. Lindsay, L. L. Tonkin, and C. C. Reed. Honorary pallbearers included the following men long associated with Mr. Corrin in the natural gas industry: Christy Payne, John B. Tonkin, R. D. Beardsley, Arthur E. Young, Ralph W. Gallagher, Howell C. Cooper, S. E. W. Burnside, W. B. Gribble, A. W. McCue, Kemble White, E. B. Nutt, L. W. Young, Jr., John G. Pew, T. B. Gregory, H. A. Wallace, Fred A. Miller, Walter L. McCloy, Edwin Robinson, and Samuel W. Meals.

John B. Corrin was born at Oil City, Pa., October 10, 1869. He grew to young manhood there and engaged in oil and gas business soon after attaining his majority. He was with the National Transit Company at Oil City in 1890. Two years later he was transferred to the South Penn Oil Company and three years later went to the Hope Natural Gas Company with headquarters in Pittsburgh.

His rise in the gas industry was rapid. He held various positions of responsibility with the Hope and allied companies. He lived and worked in different parts of West Virginia but his career centered about the Pittsburgh territory. Some years ago he was elected vice-president and general manager of the Hope Natural Gas Company, the Reserve Gas Company, the Connecting Gas Company, the River Gas Company, and the Hope Construction and Refining Company which concerns compromise the Standard Oil gas group.

His standing in the industry with which his life was so closely identified was of the highest and a few years ago he was honored by election as president of the Natural Gas Association of America and his administration was outstandingly successful.

He was an active member of the American Gas Association, Pittsburgh Chamber of Commerce and its allied bodies. He held membership in the Pittsburgh Athletic Association and was a member of the Masonic fraternity in the various branches of which he had been prominent.

He is survived by his widow, two sons, John B. Corrin, Jr. and Edward Wayne Corrin, one brother, William H. Corrin, and one sister, Mrs. Lois Young.

## Gas Makes "The House That Jack Built" Comfortable in Summer and Winter

(Continued from page 426)

Other addresses were made by Edward H. Bouton, president of the Roland Park-Montebello Co. and Jas. C. Patterson, vice-president of the Silica Gel Corp. After the formal opening, the house was thrown open to the public and the number of visitors has been up in the thousands.

The opening day was one of the hottest Baltimore experienced this summer and the contrast in the atmosphere, upon entering the house, was a source of distinct pleasure to those present. The house was sold within ten days of its opening.

The dwelling is known as "The House That Jack Built" and was featured, throughout the period of its construction, in programs over Station WBAL, radio station of the gas company.

Beside the Silica Gel Gas Operated Summer Air Conditioner, "The House That Jack Built" is equipped with other modern gas appliances, including forced draft warm air furnace, gas range, automatic water heater, laundry stove and clothes dryer.

It is estimated that the house will use about 80,000 cu.ft. of gas each summer for air-conditioning purposes, or substantially doubling the entire year's use of gas for all purposes other than house heating. The entire house, including a clubroom in the basement, is uniformally conditioned, the same ducts distributing the air in both summer and winter. Control can be had from one central point.

## Statement of the Ownership, Management, Circulation, Etc., Required By the Act of Congress of August 24, 1912

Of American Gas Association Monthly published monthly at Brattleboro, Vt., for October 1, 1932.
State of New York, County of New York, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Allyn B. Tunis, who, having been duly sworn according to law, deposes and says that he is the Editor of the American Gas Association Monthly and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, American Gas Association, Inc., New York, N. Y.; Editor, Allyn B. Tunis, New York, N. Y.; Managing Editor, None; Business Managers, None.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)
American Gas Association, 420 Lexington Avenue, New York, N. Y.; President, R. W. Gallagher, 420 Lexington Ave., New York, N. Y.; Vice-Presidents, Arthur Hewitt, N. C. McGowen, Howard Bruce, 420 Lexington Ave., New York, N. Y.; Treasurer, Wm. J. Welsh, Managing Director, Alexander Forward, 420 Lexington Ave., New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is . (This information is required from daily publications only.)

ALLYN B. TUNIS, Editor.

Sworn to and subscribed before me this 22nd day of September, 1932.

(Seal)

LAWRENCE P. BROWN,
Notary Public, New York County,
Clerk's No. 330, Register's No. 4B566,
(My commission expires March 30, 1934.)

# This "Tip Card" Satisfies Company and Employee

By John J. McKearin

Sales Manager,
Lowell Gas Light Company

I HAVE noticed lately considerable mention of the method used by different utilities in obtaining leads for appliance sales from employees.

The main difficulty with receiving tips from employees, as we found it, was that there was a considerable lapse of time between when the appliance was sold and when the employee received his bonus; as a result, we developed the "Tip Cards," illustrated herewith.

These cards are held in each department, and, when an employee has a prospect, he fills out the prospect's name, address, etc., and sends the entire card to the sales department. A clerk in the sales department immediately tears out the middle portion and sends it back to the employee, so that the employee knows at once whether his prospect will be worked on or whether some one has turned it in before.

The top part of the card is then given to the salesman, who calls on the customer and returns the card to the clerk in the sales department. If the appliance is sold, the sales clerk fills in the bonus warrant, which is the bottom part of the card, has it approved by the sales manager and sends it to the employee turning in the prospect. All the employee has to do then is present it at the cashiers' counter, collect his bonus and sign that he has received payment.

This has worked out much more satisfactorily for the employees and has eliminated considerable amount of work in the accounting department and, incidentally, will now save money in a way which we did not consider—that is, with this plan it is not necessary to make out checks, as the employee is paid in cash.

M.G.W. 28084

**TO SALES DEPARTMENT**
**TIP CARD** **No 1390**

Prospect's Name
Address
Interested in
Have D. R. call
Tip by Dept. Date
Report on Tip
1st Call By
2nd Call "
3rd Call "
Result:
Appliance Sold
Date By

---

To_____ **No 1390**

Date_____

We acknowledge receipt of Tip Card and wish to advise that this prospect has
has not been turned over to us within thirty days.

Signed_____
Sales Dept.

*No Tip Card is Good after 30 Days*

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**BONUS WARRANT No 1390**

To_____ DATE_____

We wish to thank you for your Tip # on_____

_____ for a _____

and are pleased to report to you that on_____

this party purchased a_____

If you will present this at the Cashier's counter within a few days, you will receive your bonus of $_____ for this sale.

Date Approved Sales Mgr.

Received Payment_____ Date_____

*"Let Us Have Some More Tips"*

## Gas and Electric Ranges

(Continued from page 414)

latest models of gas ranges possess all modern conveniences and appeal found in any other type. As a matter of fact, there seem to be no good engineering or economic reasons justifying the use of electric service for cooking where city gas is available.

## Natural Gas Enters Syracuse, N. Y.

Natural gas from the Wayne-Tioga field entered Syracuse, N. Y., for the first time September 18 when engineers opened valves in the last section of a 125-mile pipe.

With the line ready for use, a special force of 150 men was sent out by the Syracuse Lighting Company to "change over" the gas-burning equipment in the homes of its customers.

# Monthly Summary of Gas Company Statistics

## FOR MONTH OF JULY, 1932

Issued September, 1932, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Statistician

### COMPARATIVE STATISTICS OF 204 MANUFACTURED GAS COMPANIES FOR THE MONTH OF JULY, 1932

| | *Month of July* | | | *Seven Months Ending July 31* | | |
|---|---|---|---|---|---|---|
| | *1932* | *1931* | *Per cent Increase* | *1932* | *1931* | *Per cent Increase* |
| *Customers* | | | | | | |
| Domestic | 8,753,245 | 9,013,746 | — 2.9 | | | |
| House Heating | 39,299 | 38,987 | 0.8 | | | |
| Industrial and Commercial | 404,037 | 403,307 | 0.2 | | *See July* | |
| Miscellaneous | 6,995 | 6,813 | — | | | |
| Total | 9,203,576 | 9,462,853 | — 2.7 | | | |
| *Gas Sales (MCF)* | | | | | | |
| Domestic | 19,892,533 | 19,749,940 | 0.7 | 151,528,065 | 155,820,098 | — 2.8 |
| House Heating | 202,222 | 190,294 | 6.3 | 13,523,244 | 13,169,292 | 2.7 |
| Industrial and Commercial | 5,370,154 | 6,171,577 | —13.0 | 44,067,812 | 49,992,208 | —11.8 |
| Miscellaneous | 132,853 | 135,701 | — | 1,228,436 | 1,277,505 | — |
| Total | 25,597,762 | 26,247,512 | — 2.5 | 210,347,557 | 220,259,103 | — 4.5 |
| *Revenue (Dollars)* | | | | | | |
| Domestic | 23,491,310 | 23,575,319 | — 0.4 | 175,284,477 | 180,979,974 | — 3.1 |
| House Heating | 176,887 | 171,809 | 3.0 | 9,648,070 | 10,183,559 | — 5.3 |
| Industrial and Commercial | 4,659,927 | 5,407,745 | —13.8 | 38,184,679 | 43,312,473 | —11.8 |
| Miscellaneous | 110,342 | 114,149 | — | 839,839 | 981,859 | — |
| Total | 28,438,466 | 29,269,022 | — 2.8 | 223,957,065 | 235,457,865 | — 4.9 |
| *Gas Produced and Purchased (MCF)* | | | | | | |
| *Gas Produced* | | | | | | |
| (a) Water Gas | 9,958,790 | 10,865,557 | — 8.3 | 96,084,987 | 109,384,109 | —12.2 |
| (b) Retort Coal Gas | 2,125,209 | 2,537,466 | —16.2 | 16,797,815 | 19,344,024 | —13.2 |
| (c) Oil Gas | 499,259 | 468,435 | 6.6 | 4,698,033 | 4,540,231 | 3.5 |
| (d) Coke Oven Gas | 3,770,808 | 4,377,547 | —13.9 | 27,399,607 | 31,041,735 | —11.7 |
| (e) Reformed Oil Still Gas | 354,938 | 343,467 | 3.3 | 2,740,731 | 2,538,929 | 7.9 |
| (f) Total Gas Produced | 16,709,004 | 18,592,472 | —10.1 | 147,721,173 | 166,849,028 | —11.5 |
| *Gas Purchased* | | | | | | |
| (a) Coke Oven Gas | 6,684,998 | 7,829,024 | —14.6 | 53,658,390 | 64,174,845 | —16.4 |
| (b) Oil Still and Natural Gas | 3,025,929 | 385,389 | — | 25,987,519 | 2,674,678 | — |
| (c) Total Gas Purchased | 9,710,927 | 8,214,413 | 18.2 | 79,645,909 | 66,849,523 | 19.1 |
| Total Gas Produced and Purchased | 26,419,931 | 26,806,885 | — 1.4 | 227,367,082 | 233,698,551 | — 2.7 |

### COMPARATIVE STATISTICS OF 208 NATURAL GAS COMPANIES FOR THE MONTH OF JULY, 1932

| | | | | | | |
|---|---|---|---|---|---|---|
| *Customers* | | | | | | |
| Domestic (Including House Heating) | 4,462,387 | 4,533,750 | — 1.6 | | | |
| Commercial | 215,421 | 213,088 | 1.1 | | | |
| Industrial | 16,401 | 15,818 | 3.7 | | *See July* | |
| Main Line Industrial | 5,356 | 5,447 | — 1.7 | | | |
| Miscellaneous | 1,763 | 2,438 | — | | | |
| Total | 4,701,328 | 4,770,541 | — 1.5 | | | |
| *Gas Sales (MCF)* | | | | | | |
| Domestic (Including House Heating) | 11,926,957 | 11,908,508 | 0.2 | 178,133,770 | 192,624,355 | — 7.5 |
| Commercial | 1,849,205 | 1,763,211 | 4.9 | 28,624,745 | 29,472,093 | — 2.9 |
| Industrial | 13,407,124 | 15,822,961 | —15.3 | 103,941,506 | 118,610,658 | —12.4 |
| Main Line Industrial | 11,269,168 | 14,865,570 | —24.2 | 79,652,184 | 98,115,950 | —18.8 |
| Miscellaneous | 377,869 | 533,255 | — | 3,986,778 | 4,198,401 | — |
| Total | 38,830,323 | 44,893,505 | —13.5 | 394,338,983 | 443,021,457 | —11.0 |
| *Revenue (Dollars)* | | | | | | |
| Domestic (Including House Heating) | 9,584,766 | 9,678,026 | — 1.0 | 122,335,542 | 130,881,109 | — 6.5 |
| Commercial | 997,331 | 992,938 | 0.4 | 13,641,264 | 14,367,640 | — 5.1 |
| Industrial | 2,682,349 | 3,497,610 | —23.3 | 22,275,609 | 27,826,051 | —19.9 |
| Main Line Industrial | 1,316,869 | 2,011,007 | —34.5 | 9,660,355 | 12,966,478 | —25.5 |
| Miscellaneous | 51,527 | 58,465 | — | 650,425 | 640,701 | — |
| Total | 14,632,842 | 16,238,046 | — 9.9 | 168,563,195 | 186,681,979 | — 9.7 |

# Gas Utility Revenues Improve During July

REVENUES of manufactured and natural gas utilities aggregated $43,071,308 in July, as compared with $45,507,068 in July 1931, a decline of 5.4 per cent, according to reports from companies serving some 13,904,904 customers and representing about 90 per cent of the public utility distribution of manufactured and natural gas. This represented a distinct improvement over the two preceding months, since in June, revenues were down 7.8 per cent and in May 8.7 per cent below the levels of the preceding year.

While total sales of both manufactured and natural gas declines for the month, a change of some significance was manifest in sales for domestic purposes, which registered a small gain during July. This was the first month of the current year to witness any increase in domestic sales, and was attained despite a loss of more than 330,000 domestic customers during the year ended July 31, a drop of nearly 2.5 per cent.

Revenues of the manufactured gas companies aggregated $28,438,466 for the month, a drop of 2.8 per cent from a year ago. The natural gas utilities reported revenues of $14,632,842 which were about 10 per cent under the figures for July 1931.

Sales of manufactured gas reported for July totaled 25,597,762,000 cu.ft., a decline of 2.5 per cent, while natural gas utility sales for the month were 38,830,323,000 cu.ft., a decline of some 13.5 per cent.

New England was one of the few sections of the country where conditions ran counter to the general trend of increased sales for domestic purposes in July. In this region domestic sales for the month were down nearly 5 per cent, the result in large part of a loss of some 35,000 domestic customers during the year, a decline of 3 per cent.

## A. G. A. Convention Will Demonstrate Soundness of the Gas Industry

(Continued from page 410)

Present Practice in Appliance Servicing
F. A. Lydecker, Public Service Electric & Gas Co., Newark, N. J.

Gas Detection Instruments
S. S. Tomkins, Consolidated Gas Company of New York, New York, N. Y.

WEDNESDAY AFTERNOON

October 12

2:00 o'clock

VENETIAN ROOM—HOTEL AMBASSADOR

*Production Program*

The Gum Problem in City Gas
W. H. Fulweiler, The United Gas Improvement Co., Philadelphia, Pa.

Purging Apparatus
H. W. Alrich, Consolidated Gas Company of New York, New York, N. Y.

Symposium—Work of Gas Production Committee

a. Developments in Liquid Purification
A. R. Powell, Koppers Research Corp., Kearny, N. J.

b. Report: Gas and Coke Making Properties of American Coals
J. S. Haug, Chairman, United Engineers and Constructors, Inc., Philadelphia, Pa.

c. Paper: Developments in the Past Year in Gas Manufacturing
L. E. Knowlton, Providence Gas Co., Providence, R. I.

d. Summary: Production Committee Report
F. D. Lohr, Chairman, Seaboard By-Product Coke Co., Kearny, N. J.

Symposium—Work of Chemical Committee

a. Paper: Recent Work on Diaphragm Dressings
L. M. Van der Pyl, Pittsburg Equitable Meter Co., Pittsburgh, Pa.

b. Paper: Thiocyanate—The Industry's Latest By-Product
Louis Shnidman, Rochester Gas & Electric Corp., Rochester, N. Y.

c. Report: Atmospheric Pollution—A Progress Report by the Chemical Committee
W. H. Fulweiler, Chairman, The United Gas Improvement Co., Philadelphia, Pa.

## Gas to Heat Water and Cook on New Zep.

(Continued from page 423)

former Tappan range for the ZRS-4 *Akron* was made of aluminum.

The Navy Department has found gas to be the most satisfactory fuel for cooking aboard its giant airships. This fact was established after experiments on the *Los Angeles*. Not until after the gas range had been installed were completely adequate facilities provided for feeding the crew. When plans for the *Macon* were drawn up, a gas range was specified without question. Within a few weeks, the gas range with its new features, shown on this page, will be installed aboard the *Macon*. It was built to feed a crew of seventy-two. Compressed natural gas will be the fuel used.

## British Institution Reports on Gas Holder Maintenance

(Continued from page 430)

Even though not listed, their routine inspection undoubtedly includes this important detail, which requires much attention in America to avoid the lift being damaged when lowered to the landing position.

*The Risk Is Remote*

We may assume that the committee will provide for the inspection of waterless gas holders in a further report. As the industry has not yet accrued the large background of experience with waterless gas holders that it has obtained with the older type of container, the preparation of an inspection schedule will require a careful study and an exchange of views between the operators of the new holders. We must not overlook the many gas containers in America, of the pressure tank type, for these also require inspection and maintenance.

Appendix III is a memorandum on the subject of insurance. Apparently the insurance situation, as it applies to gas holders, differs from our own only in that there have been offers by underwriters to assume the inspection of gas holders. The committee's discussion of this matter yields the impression that the English insurance companies are somewhat unprepared to rate the premiums. This, one would expect, for the very obvious reason that the necessary actuarial data is lacking. This merely means that the record of mishaps to gas holders in England, as in America, is far too scant to provide a basis for the underwriters' computations. As the committee has well said—the risk is remote.

# Gas Appliance and Equipment Developments

### Linde Products

The Linde Air Products Company, 30 East 42nd Street, New York, N. Y., has announced a new welding blowpipe, designated as the Oxweld Type W-22. This blowpipe was developed primarily for use on pipe line work although its application is not restricted to that field. A special feature of the blowpipe is a long acetylene valve and injector which minimizes the possibility of flashback. The Linde Company also has introduced a new cylinder truck for distribution by Prest-O-Weld and Purox jobbers east of the Rocky Mountains. The truck embodies many new features in design.

### Gamon-Worthington

An arrangement recently has been made for the joint use of the manufacturing, engineering, sales and service facilities of the meter division of Worthington Pump and Machinery Corporation, Harrison, N. J., and those of the Gamon Meter Company, whose plant is located at 282-296 South Street, Newark, N. J. The sales staffs of both organizations will be directly responsible to George H. Gleeson, who will head up the meter sales activities of both companies.

### Large Capacity Meter

The Sprague Meter Company, manufacturers of cast-iron meters, Bridgeport, Conn., has developed what is claimed to be the largest capacity positive displacement meter in the world. The meter weighs approximately one ton, takes up 4 x 3 feet of floor space, is equipped with 6-inch standard pipe flanges and has a capacity of 15,000 cu.ft. at a ½-inch differential, 21,000 cu.ft. at a 1-inch differential and 32,000 cu.ft. at a 2-inch differential. The meter registers to 100,000,000 cu.ft. Among its applications are for field meters for small towns who purchase their gas from central sources, and all phases of industrial demands.

### Worthington Developments

Covering power requirements from 50 to 1000 horse power, in two eight-cylinder units, an improved line of four-cycle direct injection moderate speed Diesel engines for stationary and marine services, recently has been introduced by the Worthington Pump and Machinery Corporation, Harrison, N. J. Another new development of the Worthington Company is a self-contained automatically-primed centrifugal pumping unit. This unit is equipped with a priming pump, or evacuator, which is an adaption of the "Hytor" pump, and is licensed to Worthington under patents of the Nash Engineering Company.

**Contributions of news items by manufacturers of gas appliances and equipment to this department will be welcomed by The A. G. A. Monthly. On account of space limitations, all announcements of new products, improvements, etc., should be limited to about 100 words. No attempt will be made to describe each product or give details of construction. For such details address the manufacturer direct. Where justified, photographs will be used to illustrate these brief items. All contributions to this department should be addressed to C. W. Berghorn, Secretary, Manufacturers' Section, American Gas Association, 420 Lexington Ave., New York, N. Y.**

### Anthony Joint

Distribution of a new publication, "Handbook of Anthony Joint Cast-Iron Pipe and Fittings," has been announced by the United States Pipe and Foundry Company, Burlington, N. J. The purpose of this handbook is to furnish the gas fraternity with detailed information covering the design and installation of Anthony Joint deLavaud Centrifugal Cast-Iron Pipe. The joint is primarily designed for medium- and high-pressure gas service but, according to the manufacturers, many companies are installing it for low-pressure service as well, looking forward to possible increased pressures in the future. Superintendents, engineers and officials of the gas industry may secure this publication upon application to the company.

### Thiokol

"Thiokol," manufactured by the Thiokol Corporation, Yardville, N. J., is a product, similar to rubber, made by the chemical interaction of ethylene dichloride and sodium polysulfide. According to the manufacturers, this material is insoluble in petroleum products, benzol, drip oil, and other gas condensates and does not oxidize nor sun-crack. From tests being made, it appears to have considerable possibility in the gas industry for use as leak clamp joints, regulator diaphragms, drip oil hose, etc.

### "Centrole" Gas Range

A new model gas range called "Centrole" has been developed by the Tinnerman Stove and Range Company, Cleveland, Ohio. This range, equipped with top burner automatic lighting, together with concentrated control of valves, is designed for ease of control while still retaining its speed and efficiency. The burner box is entirely made of aluminum, adding to the convenience of cleaning and the speed of cooking. A circular, describing this new range, will be furnished upon request to the company.

### Sav-T-heat

C. A. Dunham Company, 450 East Ohio St., Chicago, Ill., has issued a booklet entitled "Modernizing the Hot Water Heated Home with Sav-T-heat and Air Conditioning," which describes a newly-developed gas-burning appliance called "Sav-T-heat" and the Dunham Air Conditioning unit. Sav-T-heat is made up of three essential parts—the generator, economizer and the exhauster—and is designed to replace existing hot water boilers. The generator is much the same as ordinary gas-burning boilers except that it is provided with a water jacket which is entirely separate from the heating system water passages. The economizer attaches to the top of the generator and is a secondary water heater. The exhauster is a small motor-driven unit which supplies the air quantity required for complete combustion.

## Two Oldest Employees Die

THE Northern Indiana Public Service Company's oldest employee and second oldest employee in point of service in the upper part of the state died within two days of each other recently at South Bend, Ind., after devoting forty-four years and thirty-nine years, respectively, to public service.

The oldest employee, Jeremiah McCarthy, died September 4, at the age of sixty-one. The second oldest employee, Joseph P. Williams, died September 2, at the age of sixty-four.

## Third Charter Member Comes Forward

**After he read in THE MONTHLY that C. W. Sears, of Pasadena, California, and Colonel M. W. Walsh, of the Louisville Gas and Electric Company, were the only surviving charter members of the Natural Gas Association of America, George S. Barrows, of Providence, has advised the Association that he has "a very distinct recollection of an informal meeting in Kansas City of a few men to discuss the need for a Natural Gas Association and the later organization meeting. I participated actively at the Joplin meeting and was on the entertainment and exhibition committees at the next meeting in Kansas City. I have been under the impression that I was a charter member."**

# Associations Affiliated with A. G. A.

**Canadian Gas Association**
Pres.—Hugh McNair, Winnipeg Electric Co., Winnipeg, Man.
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.

**Empire State Gas and Electric Association**
Pres.—Alfred H. Schoellkopf, Niagara Hudson Power Corp., Buffalo, N. Y.
Chairman, Gas Section—F. C. Weber, The Brooklyn Union Gas Co., Brooklyn, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.

**Illinois Public Utilities Association**
Pres.—Bernard J. Mullaney, The Peoples Gas Light & Coke Company, Chicago, Ill.
Sec.—J. R. Blackhall, 617 Public Service Bldg., Springfield, Ill.

**Indiana Gas Association**
Pres.—F. X. Mettenet, Public Service Company of Indiana, Indianapolis, Ind.
Sec.-Tr.—P. A. McLeod, New Castle, Ind.

**Michigan Gas Association**
Pres.—J. E. Spindle, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.

**Maryland Utilities Association**
Pres.—F. A. Mitchell, Eastern Shore Public Service Co., Salisbury, Md.
Sec.—D. E. Kinnear, 803 Court Square Bldg., Baltimore, Md.

**Mid-West Gas Association**
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Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

**Missouri Association of Public Utilities**
Pres.—A. E. Bettis, Kansas City Power and Light Co., Kansas City, Mo.
Sec.-Tr.—N. R. Beagle, Missouri Power & Light Co., Jefferson City, Mo.
Asst. Sec.—Jesse Blythe, 103 West High St., Jefferson City, Mo.

**New England Gas Association**
Pres.—I. T. Haddock, Cambridge Gas Light Co., Cambridge, Mass.
Exec. Sec.—C. D. Williams, 41 Mount Vernon St., Boston, Mass.
Chairman, Operating Div.—H. G. Taylor, Lawrence Gas & Electric Co., Lawrence, Mass.
Sec., Operating Div.—R. S. Carter, Malden & Melrose Gas Light Co., Malden, Mass.
Chairman, Sales Div.—J. J. McKearin, Lowell Gas Light Co., Lowell, Mass.
Chairman, Industrial Div.—C. S. Hilton, The Pawtucket Gas Co., Pawtucket, R. I.
Sec.-Tr., Industrial Div.—W. S. Anderson, Boston, Mass.
Chairman, Accounting Div.—G. S. Lees, New Haven Gas Light Co., New Haven, Conn.
Sec.-Tr., Accounting Div.—C. D. Perkins, Malden & Melrose Gas Light Co., Malden, Mass.
Chairman, Manufacturer Div.—A. M. Slattery, The Hoffman Heater Co., Boston, Mass.
Sec.-Tr., Manufacturers Div.—J. H. McPherson, James B. Clow & Sons, Boston, Mass.

**New Jersey Gas Association**
Pres.—J. D. Alden, Jersey Central Power & Light Co., Asbury Park, N. J.
Sec.-Tr.—H. E. Cliff, Public Service Electric & Gas Co., Newark, N. J.

**Ohio Gas and Oil Men's Association**
Pres.—L. K. Langdon, Union Gas & Electric Co., Cincinnati, Ohio.
Sec.-Tr.—Wm. H. Thompson, 811 First National Bank Bldg., Columbus, Ohio.

**Oklahoma Utilities Association**
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Mgr.—E. F. McKay, 1020 Petroleum Bldg., Oklahoma City, Okla.

**Pacific Coast Gas Association**
Pres.—Harry L. Masser, Los Angeles Gas and Electric Corp., Los Angeles, Calif.
Mang. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

**Pennsylvania Gas Association**
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**Southern Gas Association**
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Sec.-Tr.—S. L. Drumm, New Orleans Public Service Inc., New Orleans, La.

**Southwestern Public Service Association**
Pres.—Knox Lee, Southwestern Gas & Electric Co., Marshall, Texas.
Sec.—E. N. Willis, 530 13th Street, SE., Brownsville, Texas.

**The Public Utilities Association of Virginia**
Pres.—T. Justin Moore, Va. Elec. & Power Co., Richmond, Va.

**Wisconsin Utilities Association**
Pres.—E. J. Steinberg, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.
Exec. Sec.—J. N. Cadby, 135 West Wells St., Milwaukee, Wis.

**Fourteenth Annual Convention of the American Gas Association**
**Atlantic City, N. J. - - - October 10-12, 1932**

# Personnel Service

## SERVICES OFFERED

**Executive** (46) eighteen years' practical experience in the stove and foundry business, both gas and coal, in sales and production, desires connection. 595.

Engineer or assistant to executive. Familiar with design and application of **rates** in the manufactured or natural gas industry and negotiation of rates with municipalities. Experienced in preparation of rate cases and public service commission practice and rate procedure in a number of states. Electric experience also. 606.

**Superintendent** (45) who began by digging ditches and was advanced up through street foreman to sales manager; experience includes coal, water and natural gas. A man who has never had labor trouble and does not mind how many hours he works. High and low pressure distribution experience. 607.

**Sales engineer,** capable of managing department with experience in house heating work covering surveys, estimates, sales promotion, service, installation, repairs and maintenance, also industrial steam boiler application and water heating covering large volume. Broad general and technical knowledge. Married. 610.

**Industrial gas sales engineer** of long service in Eastern utility, with background of broad engineering and sales experience, will consider responsible position with utility, manufacturer or consulting engineers. Salary of no immediate importance provided responsibility and opportunity exist. Familiar with electric heat and all fuels, including necessary equipment. 612.

**Engineer** offers the experiences gained in solving the design, construction and operating problems of many gas plants and distribution systems, while gas engineer for one of the large equipment companies, coupled with a technical training and actual experiences as plant superintendent and local manager. 614.

**Gas engineer** (32) technical graduate. Five and one-half years assistant superintendent of large water gas plant. Two years with engineering company estimating gas plant and alteration construction. Familiar with good operating costs and know how to get them. Prefer position as operating engineer. 615.

**Engineer** (B. S. and M. E.) with 13 years' diversified experience in coal and water gas production, distribution and plant erection followed by eight years in plant design, economic surveys, utility appraisals and steam engineering. Strong background of research work and experience as instructor. 616.

Technically educated gas **engineer,** fourteen years' combination coal and water gas experience, has worked in various capacities, from cadet to superintendent of plant and distribution. Has thorough knowledge of coals, having been in the research department of a large coal company for the past five years. 620.

For the past ten years I have successfully sold water heaters. Am seeking a connection with a utility which needs and desires to increase its **water heater** sales. My sales record is clean and honest; am capable of taking full charge of and responsibility for water heating division of progressive utility. 622.

All around gas man (31), married, graduate Chemical Engineer. Experienced in design, construction and operation of water gas plants and high and low pressure distribution systems. Good business experience and judgment. Interested in **engineering,** operation, construction, sales or management. Location not important; available now. 624.

**Sales Representative** and engineer. Eight years' experience with leading manufacturers of gas ranges, automatic water heaters, gas steam radiators and boilers. Capable of managing department, broad knowledge hot air and conditioning, sales, promotion, surveys, estimates, installations; have intensively covered utilities and municipal trade New York, New Jersey and Pennsylvania. 626.

**Engineer,** experienced in air entrainment and air injection devices; has good knowledge of heat transfer and mechanics, air flow and diffusion problems; good fundamental engineering training. Possesses initiative, ingenuity and an inventive and research turn of mind. Now employed. 627.

## SERVICES OFFERED

Gas engineering graduate (B. S. & M. S., Ch.E. Purdue); specialized training in utility operation. Several years' experience with leading mid-west gas company. Desires employment in production, **distribution** or **sales.** Age 23, married. Will go anywhere. 628.

**House heating** engineer: University graduate, ten years practical experience application of gas to house heating with both manufactured and natural gas. Covering direct sales to customers, salesmen training and supervision, organization of department for sales, installation and service; development of rates and merchandising. Also industrial, distribution, construction and property management experience. 629.

Twenty years' broad experience **sales,** business, management, general engineering, with particular experience in handling and metering air, gases, and mixtures. Graduate mechanical engineer, licensed professional engineer; married; excellent personal qualities and character. 630.

**Operating engineer.** Graduate mechanical engineer (30) desires position in coke plant, coal laboratory, coal washing plant, or engineering office. Experience: five years' coal tar and oil distillation, coke oven and coal washing operation, designing of steam and hydraulic engines, engineering and planning, time studies. 631.

**Manager.** Thoroughly qualified to handle difficult situations. Diversified experience, both practical and technical in gas manufacture, distribution, construction, office practice, merchandising and purchasing. A thorough executive. Married. 632.

**Gas engineer** (34) married. Early technical training chemical engineering, nine years' chemical research gas analyses, fuels, gasoline adsorption. Five years active in gas engineering in charge plant construction, inventory and appraisal valuations specializing in depreciation studies and public service commission contacts. 633.

Aggressive **appliance salesman** seeking a substantial connection with either a manufacturer or utility company. Eighteen years' experience selling gas appliances of every description, throughout eastern and southern territories. Have no preference as to location. Ability to sell, supervise and organize. (40) Married. 634.

Practical **gas man** with wide distribution experience. Thoroughly familiar all main and service work, high and low pressure; boilers, refrigerators, etc. and complaint work. Shop foreman. 635.

**Manager** (graduate engineer) of natural gas company is especially qualified to make market surveys, set up rates and build industrial load. Also experienced in organizing and operating a group of small companies. Has several years' experience along manufactured gas lines. 636.

**Business builder:** wide administration and sales experience, a successful record of accomplishments in the range industry and valuable contacts among important gas range outlets are offered progressive manufacturer. For full information ask Personnel Service for my confidential classification record or write 637.

Improving plant results is the specialty of **engineer** having broad international experience with two of the largest gas engineering and construction companies. Thoroughly familiar with the design and operation of the most modern plant equipment; has broad experience in development of apparatus and a wide acquaintance with the gas fraternity. 638.

From the machine shop to designer and **draftsman;** thoroughly familiar with architectural and steel plans. Can check and prepare specifications. Technical education. (31) Single. 639.

**Manager** experienced in the operation of group properties, natural gas, manufactured gas and electricity in the United States and Canada. Conservative operator with excellent new business record. 640.

Long experience **selling** to utilities and exceptional ability in making friends quickly and holding them. Can sell to the manufacturing or commercial side; many years' actual management of gas property. Now is the time to start promotional work and establish new accounts. Please give me the opportunity to figure with you. 641.

## SERVICES OFFERED

Young (single) aggressive combination company **salesman** with unusual record of filling established merchandise quotas for both gas and electric equipment; held first place in competitive sales program of organization. Thoroughly familiar with all domestic and commercial appliances; available for utility company or equipment manufacturer. Specialty is contacts and closing. 642.

Natural gas **sales manager,** technical graduate, with eighteen years' experience in domestic, commercial, industrial and house heating sales, desires employment where future opportunities are good. Experience also includes manufactured gas and electric utility sales, rates, publicity, etc. Has had close contact with all operating and most management problems. 643.

## POSITIONS OPEN

**Manufacturer** of approved gas appliances wishes representation, through manufacturers' agents, for gas thermostatic controls. 0239.

Large nationally known manufacturer of automatic water heaters in complete price range, desires **distributor** for Columbus, Ohio, territory. An attractive and exclusive franchise is available. 0242.

**Distributorship** on complete line nationally known automatic water heaters for Dayton, Ohio, territory is available. No missionary work to be done. Real opportunity for live organization. In writing, advise lines now handling. 0243.

**Manufacturers' agents** wanted to contact utilities for nationally known water heater manufacturer with complete line of A. G. A. approved gas water heaters. Commission basis. Advise lines now handling and territory covered. 0244.

Manufacturer of conversion gas range burner for use in coal and wood ranges, or combination coal, wood and gas ranges, desires to place commission **salesmen** or factory representatives outside of New England States, especially in the natural gas territories. Prefer men acquainted with the gas utility trade; have no objection to salesmen or factory representatives handling other non-conflicting lines along with our product. 0245.

**Manufacturers' agents** wanted in a number of territories by manufacturer of gas boilers. Commission basis. Advise lines now handling and territory covered. 0247.

A special packing for pipe joints which finds ready acceptance with distribution engineers is offered as a profitable side line to **salesmen** calling on gas and water companies. 0248.

Gas **appliance salesmen** wanted. Those having utility sales experience preferred. We have an unusually attractive proposition for men who can show a clean, business producing record. We virtually put you in business for yourself. Line now established and in active demand, assuring an income from the outset. Stocks are carried and sales financed. No investment required. Straight commission. No drawing account. Contracts now being made. Desirable openings available in practically every state. 0249.

Experienced local **sales manager** wanted at once; City 250,000 population—300 miles from New York City. Gas conversion burner and conditionaire sales. Salary and commission; also experienced salesmen on commission basis. 0250.

An unusual business **opportunity:** Nationally known manufacturer of gas fired heating and air conditioning equipment is interested in making connections for Ohio and Western Pennsylvania territories. Established organizations dealing in mechanical lines or individuals having necessary qualifications will be considered. Large profits possible in an industry with a most attractive future. 0251.

Alert and aggressive **sales manager** for large property with broad experience in all gas company sales activities, domestic and commercial; record of good public and dealer relations essential. State age and actual sales or assistant sales manager experience with utility company. 0252.

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